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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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A FRENCH LIFE-SAVING DEVICE.

The society to aid shipwrecked sailors at Boulogne, France, has recently adopted two improved life-saving appliances for use along the coasts. One is an apparatus for launching life boats beyond the surf line and the other is a new line device for carrying baskets in which shipwrecked men are pulled ashore. In the launching apparatus an incline is built on the principle of a toboggan slide running from the shore a good distance out into the water. The life boat is held in a horizontal position on a carriage which is let down to the water by means of a cable coiled around a drum. If the water reaches the boat in this horizontal position when the end of the incline is reached, the boat simply floats off. If the tide is out, due to the ebb and flow of the tides on the coast shore line, the boat can be made to incline by depressing the supports which hold it in a horizontal position, and the launch is almost as easy as when there is no necessity for this action.

The carriage for the boat slides down two rails. The life-savers take their places in the craft before she starts down the incline and stand ready to row off shore as soon as she is afloat. The inventor is an engineer named Poilly. The boat and sliding apparatus, with a crew on board, weigh about ten tons. It has been tried successfully, and has secured the commendation of numerous life-saving societies. There is one point, however, which does not seem clear to us in this toboggan slide appliance for launching life boats and that is, how such a structure would stand the surf on any exposed part of a beach or coast line.

The second contrivance is an endless rope in pulleys which is pulled on board the shipwrecked craft by a small line that is shot out to it. The basket is suspended by the upper part of the loop and the lower part steadies the carriage as it is brought in.

MEASUREMENTS OF STREAM DISCHARGES.

At a meeting of the Engineers' Club of Philadephia, E. H. Newell, Chief of the Hydrographic Division of the U. S. Geological Survey, read a paper which he had prepared for the Club on "Methods and Results of Measurements of Stream Discharges, made by the United States Geological Survey." After some general statements on the value of a knowledge of the water supply of a country the speaker described the location of stations at which observations of water flow are being made, compared the fluctuation of various streams through seasons and years, and also with each other, and discussed the regimen of rivers east and west, snow fed and rain fed. He summed up the whole matter in a comparison of the depth of rainfall upon various parts of the United States and the relation of this to the run-off or depth of water drained from the surface, showing that under various conditions of topography this amount was from 50 per cent down to 1 per cent, or even less.

THE ERIE CANAL LIFT LOCKS.

The proposed steel lift locks on the Erie Canal at Lockport, N. Y., which state engineer C. W. Adams has designed to replace a flight of gate locks, will consist essentially of two troughs raised and lowered in a steel framework. Lines of shafting are to run along the top of the frame parallel with the troughs and carrying sprocket-wheels every five feet. Chains from the troughs pass over these wheels and are attached to counter-weights in such a manner that practically only the resistance of friction has to be overcome in operating the locks. The ends of the troughs and the ends of the canal levels are to be closed by steel gates moving in vertical guides. At the upper end of the framework between the two troughs it is proposed to construct a turbine-house, where power will be obtained for operating the machinery. It is estimated that the cost of the improvement will be $300,000 and that four men will be sufficient to manage the machinery. It is also stated that two minutes will probably be sufficient to raise a trough and that boats can be transferred from one level to another in a quarter of an hour.

SCREW PROPELLERS AND MARINE PROPULSION.

The theory of screw propulsion has been ably dealt with in a volume just issued by John Wiley & Sons, scientific pulishers, New York from the pen of I McKim Chase, M. E. The author has placed before marine interests a comprehensive treatise and practical work that should elucidate the principles of screw propellers, the manner of their generation and their peculiarities and the various methods employed in their construction.

The propelling screw is, in all probability, a very ancient contrivance. The date of its first application as an instrument of propulsion remains in oblivion, but it is said to have been known in China at a very early period. However, considerable improvement has been made in the manufacture of screws. They are now cast entire of bronze or iron, and of any desired dimensions. The author of this valuable work very pertinently observes that, the water below a ship may be supposed to be divided into a series of layers. The ship's movement produces a corresponding motion in the layer of water immediately adjacent to the ship's skin; this layer produces motion in the layer immediately below it, and so on, as far as the wake motion extends, each succeeding layer having a uniformly reduced motion, until it becomes nil (when the water is of sufficient depth.

If the bottom is reached before this motion ceases, the layer immediately in contact with the bottom is dragged to some extent over it and thereby has its motion retarded. This retardation is communicated to the layer immediately above it, and this again retards the layer immediately above it, and so on, until the retard ing influence of the bottom reaches the ship. Thus the ship's resistance is increased, because the movement of the ship is the primary cause of the motion of the water.

This retardation caused by the bottom is analagous to that of a flowing stream. It is well known that the velocity of the current of a stream is least below and along its banks, where it is retarded by the bed and banks. From the bottom upward the velocity of flow gradually increases, the greatest velocity being at the surface in mid-stream.

CHEAP LIGHT-HOUSE CONSTRUCTION.

The light-house that has been erected by the Light-House Board at Paris Island, Port Royal Sound, South Carolina, is novel in form, and, though erected as an experiment, it has done its duty well. It is the most economical structure in the history of light-house construction. When first erected it was regarded with many misgivings by experts.

The light, which is run up and down on rails in the plane of the structure, is housed by day. At night it is hoisted to its place at the apex of the triangle by machinery worked in the oil-house at the base of the structure. The large foundation plates are about 40 feet apart. The focal plane of the light is 120 feet above the sea level, but the top of the structure is 132 feet from the ground. The cost of the iron work set up is $9,400, and that of the structure complete and lighted about $12,000.

NEWS AROUND THE LAKES.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

P. H. Fleming & Co., chartered the steamer Ogemaw and schooner James Mowatt for wheat to Toledo at 1½ cents.

Counselman will build another elevator for oats at South Chicago. It will have a capacity of 1,400 000 bushels.

The Dudley Lumber Co. is moving its wholesale yards from Fremont, Mich , to St. Joe, where they have excellent dock facilities.

George Gordon, an old lake engineer, who became insane two week ago, died last week, and was buried at St. Joe, Sunday. He had spent nearly all his life on the lakes.

Carr & Blair chartered the steamer Progress for oats to Port Huron at 1 cent, the steamer A. G. Lindsay for oats to Ogdensburg at 2⅛ cents, the schooner Senator for wheat to Toledo at 1½ cents.

Captain H. Channon, the well known ship chandler left here last week for New York and will leave there this week on the new steamship St. Louis for England, the land of his birth, on a pleasure tour.

Palmer, Cook & Calbick chartered the steamer W. P. Ketcham for wheat to Buffalo at 1½ cents, and her consort George P. Owen for oats to Buffalo at 1⅛ cents, the steamer New Orleans for corn to Buffalo at 1¼ cents.

J. J. Rardon & Co. charterd the steamer City of London for corn to Buffalo at 1¼ cents; the steamer Hesper for corn to Erie at 1¼ cents; the steamer Caledonia for corn to Port Huron p. t; the barge Wm. Grandy for wheat to Toledo at 1½ cents.

The new steamer Chili, Capt. A. B. Drake arrived at South Chicago, Friday morning on her maiden trip, with 3,346 tons of coal from Buffalo. She was recently launched by the Cleveland Ship Building Co. and is reckoned one of the best built freighters on the Lakes.

Henry B. Burges, shipbuilder of Manitowoc was in this city Saturday. He reports that the schooner Nelson Bloom was in dock at his shipyard last week for recalking her bottom, the barge Bay State was on the boxes for re-calking, the steamer F. & P. M. No. 3, is now in dock for new frames aft, new ceiling, re-calking and re-ironing.

J. G. Keith & Co. chartered the schooner M. E. McLachlan and steamer Missoula for corn to Buffalo at 1¼ cents, the steamer F. & P. M. No. 5 for oats to Port Huron at 1 cent; steamer America for oats to Buffalo at 1 1-16 cents; steamer P. J. Ralph and consort Harold for wheat to Toledo at 1½ cents; the steamer Neosho for oats to Buffalo at 1 cent: the steamer Majestic for corn to Buffalo at 1¼ cents.

At the Chicago shipyard the schooner yachts Hawthorne and Crusader and sloop yacht Anola were in dock for bottom scraping and painting the steamer Soo City for repairs to stern bearing, the barges Noque Bay and Mantenee for re-calking, the steam yacht Bessie Ross for a new wheel, shaft and sea cocks, the steamer Jay Gould for re-calking.

At the Chicago Ship Building Co. the steamer Christopher Columbus was in dock for a new wheel, the steamer Fred Kelley for repairs and recalking bottom, the steamer Kittie M. Forbes for some new outside plank, some new stanchions and deck beams and deck, the barge Malta for repairs to damage done by collision with the barge Stephenson.

At J. B. Bates & Co.'s shipyard the schooner Mary D. Ayer received a new bowsprit and jibboom and repairs to catheads, the schooner York State a new mainmast, the schooner Mineral State had her top sides calked, the schooner Ellen Williams a new jibboom, the steamer Colin Campbell a new mainmast, the schooner Charlotte Raab had her top sides calked, the schooner George Sturges new anchor stock and timber heads, the schooner yacht Hawthorne some general repairs.

The great steamship North West reached Chicago Tuesday night at 11 o'clock, with a large party of prominent eastern people, and a crowd of newspaper men from the east and Milwaukee. The North West left Milwaukee at 5:30 p. m , and beat, it is claimed, the Milwaukee-Chicago run of the Christopher Columbus by ten minutes, the North West's time being 4 hours and ten minutes. The fine steamship attracted general admiration, and is thrown open for inspection Wednesday.

The schooner-rigged steam yacht Bessie Ross arrived here last week from Galveston, Tex. She is in command of Capt. A. Anderson, and is owned by Geo. B. Hayes, of Buffalo, who purchased her at Galveston, where she was formerly used as a quarantine boat for the state of Texas. Her dimensions are 101 feet over all, 11½ feet beam, 8 feet hold. She has a Herreshoff fore and aft compound engine 6½ and 10 by 10 inch stroke, and a Roberts water tube boiler allowed 200 pounds steam pressure. Her average speed is 18 knots per hour. Her cabin is finished like a Pullman sleeping car and has accommodations for 18 persons. Mr. Naylor, special correspondent for New York papers, is on board writing up and illustrating the trip from Galveston to Buffalo. She will leave for the latter port in a few days.

The new steamer I. Watson Stephenson, Capt. John Nicholson, arrived here Saturday from Marinette, on her first trip, with 800,000 feet of lumber, and her consort, the barge Peshtigo, carrying 650,000 feet of lumber. The I. Watson Stephenson was built at West Bay City by F. W. Wheeler & Co., for the Stephenson Transportation Co., of Marinette. Her dimensions are 172 feet keel, 184½ feet over all, 35 feet 3 inches beam, 12 feet molded depth. Her engine is fore and aft compound 18 and 36 by 32 and boiler of Scotch type 12 by 12, allowed 135 lbs. steam. She has the American Ship Windlass Co.'s steam windlass forward and steam capstan aft. She is well and strongly built of the very best timber and has steel straps 2½ by ⅝ on her keelson, steel chords 10½ by ½ all around, steel arches 16 by ½ and steel strapping 4 by ½ inch. She is edge bolted with 1 inch iron and through bolted with ⅞ iron. Her cabins and dining room are finished with birch hardwood finely polished and she is finished and furnished up to F. W. Wheeler & Co.'s usual elegant style.

BUFFALO, N. Y.

Special Correspondence to The Marine Record.

The steamer Denver is receiving repairs at Mills' dry dock.

Buffalo and Toledo steamers report an unprecedented volume of business.

The steamer Niagara got a log in her wheel last Thursday and was detained some time getting it out.

Capts. C. E. Benham and George Presley, from Cleveland, held a survey on the schooner Ida Keith at this port.

The trial of hard coal on the steamship North-West was not entirely satisfactory, owing to the extra length of time required to clean fires.

Capt. Frank D. Welcome has resigned as master of the steamer Northern King and Capt. M. H. Murch, of Cleveland, succeeds him in command.

Capt. John Perew represents Smith, Davis & Co. at the Runnells, and Capt. George McLeod looks after the interests of the same firm on the Jack.

John Brill, a grain scooper forty-two years old, missed his footing and fell into the hold of the W. M. Egan Thursday morning. He died in a few hours.

Buffalo coal shipments for May were 259,788 tons, as compared with 240,747 tons in May, 1894; cement, 102,350 barrels; salt, 120,464 barrels; sagar, 259,596 barrels.

John C. Devney, of Ashtabula, and Samuel Murphy, of Cleveland, have been holding a survey on the steamer L. R. Doty, which was run into by the Italia at Ashtabula last week.

There are two drill boats at work just below the blast furnace, and a drill and dredge boat are just completing the work that has been in progress at Horseshoe Reef for two or three years.

Secretary C. H. Keep, of the Lake Carriers' Association, is preparing an estimate of the capacity of the entire lake fleet at certain drafts, for use before the board of engineers, which will investigate the effect of the Chicago drainage canal.

Receipts of grain, flour, and wheat for May were 27,975,058 bushels, as against 19,173,717 bushels in May, 1894. Flour receipts are behind, but wheat and corn show considerable increase. Lumber receipts were 35,067,000 feet, an increase of over 500,000 feet.

The board of engineers who examined Buffalo's proposed harbor improvements have agreed on recommendations, the details of their report being withheld for the present. These will, however, be confined to repairs on the work ruined by the great October storm of 1893. and the best direction for further extension.

There is quite a struggle for records between the two "Soo" Line whalebacks, Pillsbury and Washburn. The Washburn left Buffalo Tuesday afternoon, 28th, at 4 o'clock, light, and returned Sunday night with 101,500 bushels of oats and 6,000 barrels of flour, beating the best time of the Pillsbury—5 days, 17 hours and 30 minutes—by 12 hours and 35 minutes.

Last February the state authorities began the improvement of the Ohio basin. About the first thing done was to tear down the bridge across the entrances. Then some work was done to widen the passage and after other obstructions were removed the work stopped. It looks like an ancient ruin in that quarter now, and no one knows when the work will begin again.

DETROIT, MICH.

Special Correspondence to The Marine Record.

The damage to the Chemung by stranding on Bar Point was $13,000.

The schooner Sonora is getting a thorough overhauling at Oades' dry dock.

James Murphy lost his life on the steamer Russia by falling into the hold on her last trip.

W. Dulac's lumber scow Eugenia Vesta, of Mt. Clemens, is on the marine railway at Oades' having her bottom calked.

The J. P. Scranton Lumber Co was awarded the contract for furnishing lumber to renew the elevated walk at Calument life station.

The hull of the Sakie Shepard completed repairs at Oades' shipyard, and she has gone to St. Clair for new cabins and upper works.

Oades' shipyard has just turned out two lighters for the Amherstburg Dredging Co. Calkers' wages have been advanced 25 cents a day at this shipyard.

Postmaster Euright has chartered the little steam yacht Clio, 50 feet long, for the present season of navigation, and will use her in the Detroit River postal service which begins June 10th.

The body of Engineer F. W. Robinson, of the steamer Unique, who was drowned at the time of the accident to the boat, was found near Grosse Point, Tuesday morning in a badley decomposed condition.

Mrs Elizabeth Westphal wife of the late captain of the schooner Glad Tidings, sunk at the Limekiln crossing last season by the Pathfinder, has settled her damage suit against Pickands, Mather & Co., for $1,600.

Carkin, Stickney & Cram, the dredging firm, will move its entire plant and base of operations from Bay City to Detroit. It has a capital stock of $150,000 of which Willard S. Carkin, holds 3,000 shares; Watt Stickney, 1,875 shares and R. J. Cram, 1,125 shares.

An order has been made out in the United States Court at Grand Rapids, modifying the decree in the case of the Farmers' Loan & Trust Co. against the Toledo, Ann Arbor & North Michigan road, to include the sale of car ferries Nos. 1 and 2, and fixing the lowest bid that can be made for them at $50,000 each. Each cost three times that amount.

General manager, David Carter, of the D. & C. line has decided not to charter the steamer City of the Straits to the Cleveland & Buffalo line, but will send her to Cleveland June 15, and will put her on the Put-in-Bay route the following day. She has been refitted throughout. Capt. Duncan McLachlan will be in command again this season with Hugh McLachlan as mate and James Middleton as engineer.

MILWAUKEE, WIS.,

Special Correspondence to The Marine Record.

The schooner Cape Horn has been getting a new center board.

The steamer Samoa, recently on Hyde Park Reef, is here for repairs.

The steamer W. L. Wetmore has just been supplied with a new Sheriff's wheel.

The south pier at Sheboygan is to be moved 100 feet, thus widening the entrance.

The F. & P. M. No. 3, is in dry dock at Manitowoc. Repairs will consume two or three weeks.

The Goodrich Co. will have the Virginia on the Chicago and Milwaukee route about June 10.

The proposed sale of the tug Starke to James Rooney, of Toledo, is off that gentleman having invested in a Buffalo tug.

The schooner Isabella Sands is receiving a thorough rebuild to class her up to A 2. The sloop yacht Viola is also being rebuilt.

The steamer Christopher Columbus will start on the Chicago route June 15. Her machinery has been thoroughly overhauled and she is expected to make 21 miles an hour.

Capt. Albert Borkenhagen died at Kenosha May 29, aged 53 years. He was an old-time lake captain, and was at the time of his death master and owner of the fishing tug Fred Engle.

The damage sustained by the Anna P. Grover while on the beach last season at South Manitou, is now being repaired at Sheboygan. When she comes out she will tow behind the Pine Lake, formerly the steambarge Ida Torrent.

The revenue cutter Andy Johnson is again in commission after a long stay in dry dock. Her officers are A. B. Davis, commander; W. H. Cushing, first lieutenant; J. L. Reinberg, second lieutenant; J. A. Severance, first engineer.

At the Milwaukee Dry Dock Co.'s shipyards, the steamer A. McVittie is in dock and will receive 54 new frames 18 by 21 inches, a new fore foot and new bottom planking from bilge to bilge extending 154 feet from the stem, and recalking.

The steamship North West made her first appearance at this port Tuesday, with a party of prominent guests aboard, who scattered almost as soon as the steamer arrived, to visit the chief points of interest. This left the North West free to the crowd of visitors who swarmed to see her, and 3,000 or 4,000 people took advantage of the opportunity to examine this chef d'-ouvre of marine architecture.

DULUTH AND SUPERIOR.

Special Correspondence to The Marine Record.

Twenty lumber cargoes, aggregating 15,000,000 feet, were shipped from Ashland last week.

The steamer City of Duluth broke three buckets off her wheel at Lake Linden and had to come here for repairs.

Napoleon Grignon has nearty completed Inman's new tug. She will be named the Dan Christy and will cost, Capt. Inman says, $13,000.

The second of the two steel Standard oil carriers was launched at the American Steel Barge Co.'s yard Tuesday. The first is about ready to go into commission.

May was the heaviest shipping month in the history of Two Harbors; the total tonnage being not far from 275,000. The first Fayal ore was received at the Two Harbors docks last week.

Early Sunday morning the steamer Otego left for Cleveland, having been patched up sufficiently to stand the trip. Capt. Joseph Doville, her new owner, will thoroughly refit and repair the Otego, and will put her into the Kelly Island stone trade.

There were 376 arrivals and 365 departures during the month of May, as compared with 261 arrivals and 247 departures in May, 1893, and 243 arrivals and 228 departures for May, 1894. These figures include only boats which pass through the Sault canal.

Capt. W. H. Singer has purchased the tug H. B. Abbott for $8,000 and will put her into commission as soon as he completes some repair work on her. She measures 80 by 18 by 10 feet, and has a 22 by 24 engine with a capacity of 145 pounds of steam. She was sold by J. M. U. Thompson.

Circuit Judge Stone has suspended sentence on the union ore trimmers at Marquette who ignored his injunction April 29 and drove the old boss trimmer's men off the dock. This was done on condition that they should pay into court a fine of $100 to reimburse the complainants for the expense they had been put to, and this was paid promptly.

ALPENA, MICH.

Special Correspondence to The Marine Record.

The tug Sea Wing has been seized at Erie under attachment on a suit filed by the Alpena Fish Co.

Twenty-one lumber cargoes cleared from this port last week. The total shipments for the week were 5,357 feet of lumber, 250,000 lath, 24,000 railway ties, 15,000 cedar posts, and 1,500 telegraph poles.

Messrs. W. B. Comstock, W. L. Churchill and others have about completed arrangements for the formation of a company to cut the immense amount of timber held in Canada by the Comstock Bros. It is not known how much there is of the Comstock timber, but it covers four townships and runs into the hundreds of millions—enough to keep the Churchill mill running for 20 years at least, and if a box factory, planing mills, etc., are put in as at present planned, and the long-expected good times come again, the plant will employ several hundred men.

The work of rebuilding the tug John Owen, owned by Gilchrist & Fletcher, has been completed, and she is again in commission, almost as good as the day she was launched as little of the old hull remains, and she will tow logs from the Canadian pineries to this city to be worked up. The machinery has been overhauled whereever necessary, and is in good shape, The compound engine has great power, enabling the tug to haul rafts of 5,000,000 feet. Capt. Thomas Lillis will command her, with a crew of seven men in addition to engineer David Thompson.

ASHTABULA, O.

Special Correspondence to The Marine Record.

Receipts of ore for May aggregated 338,859 tons. Coal shipments were 22,511 tons.

Five new King machines are to be built at once on the P., Y. & A. doch at Ashtabula.

Sunday dock work is an uncommon thing for this season, yet a number of boats that were partially unloaded Saturday were unloaded Sunday and got away.

The life saving crew were suddenly called to make a rescue on land Sunday evening. A gentleman and several ladies and children were riding down Franklin street toward the life saving when the horse became unmanageable. Members of the crew saw the runaway and hastened out and caught the horse. The occupants escaped with a bad fright.

COLLINGWOOD, ONT.

Special Correspondence to The Marine Record.

The government survey of Georgian Bay has just been completed, after several years' work, under Commander Stewart, It occupied eleven seasons, and cost $215,000.

The St. Clair and Erie Ship Canal Co. will apply for an act to amend the act of incorporation by increasing its power to issue bonds from $5,000,000 to $8,000,000 and to use the money for a greater variety of purposes.

The railroad commissioners at Ottawa have refused permission to a Montreal syndicate to build a $1,500,000 bridge across the St. Lawrence river, on account of its being an obstruction to navigation.

TOLEDO, O.

Special Correspondence to The Marine Record.

The fire department sank the tug Jessie P. Logie, in putting out a fire on her, Friday.

James Rooney, the dredging contractor, has purchased the tug John Johnson from Hand & Johnson's tug line, of Buffalo.

The engines for the first of the Shenango car ferries are being received at Craig's ship yard from the Frontier Iron Works, of Detroit.

The steam craft in Toledo harbor have been keeping flags at half mast in memory of Engineer Ralph Hand, who died here a few days ago.

A channel 400 feet wide is being dredged from Madison street to the Lake Shore Elevator, under the supervision of Assistant U. S. Engineer Blunt.

The steamer A. A. Burch, of Sandusky, has arrived at this port for a general overhauling in dry dock. After repairs she will go into the Johnson Island excursion business.

SANDUSKY, O.

Special Correspondence to The Marine Record.

The Dove has gone back on her old route between Toledo and Monroe.

The steamer American Eagle is in commission again, after a thorough overhauling and refitting.

A. W. Dwelle, formerly captain on the Louise, has been appointed master of the Wellington R. Burt.

Capt. W. J. Harlow's crew, on the steamer Preston, struck on the way down last week, and gave him considerable trouble. A new crew was shipped here.

The steamer A. W. Burch has gone to Toledo to receive a general overhauling in dry dock. When she returns she will go into the Johnson's Island excursion business.

The suit brought against the schooner Montana by the 'longshoremen's union has been settled. The captain of the boat paid the claim of $108.50 and costs amounting to $8.25.

CLEVELAND, O.

Special Correspondence to The Marine Record.

This port is bent on river improvements, if committees and newspaper talk will do it.

The steamship North-Land will leave for Buffalo Thursday night or Friday morning to go into commission.

The schooner yacht Priscilla is now on Lake Ontario on her way to this port from New York. She will be a fine addition to the C. Y. C. fleet.

Capt. W. Harlow has been appointed night watchman of the Cleveland tug lines. Nothing within sight of this port will be allowed to signal for tugs as long as Capt. Harlow is on the watch at the piers.

The apparatus in the old lighthouse tower at the corner of Main and Water streets, at this port, will be used for the lighthouse which is to be erected on Lake Ontario at Braddock, near Charlotte, N. Y.

The new steamer Chill has begun to make money. She is a duplicate of the I. W. Nicholas, and on fifteen feet of water will carry 3,200 tons of ore and on eighteen feet 4,500 tons. The Cleveland Shipbuilding company took the contract to build her in six months and beat that time by ten days.

Owners are getting to the point where they consider running or managing vessel property for the honor thereof is at a discount. The inevitable must occur, and that is that they will get together and look for fair living freights, otherwise, they see that they will simply run into "a hole in the ground."

There are some objections being made to the weather predictions sent out broadcast relative to lake storms, and its effect on the lake passenger traffic. Storm warnings for hard gales, cyclones, hurricanes, typhoons, tornadoes, etc., ought not to be heralced without reason, though it does not follow that hours after a breeze has set in a signal should be authorized.

The shipyard of the Globe Iron Works Company, is a busy place these times, as they are building a fleet of steel boats for the lake and canal trade, also a steel cargo schooner for lake business. There are several contracts being figured on by this company, but up to the present nothing is closed, or rather can be given out for publication, though vice-President J. F. Pankhurst and Mr. Luther Allen have their pencils sharpened on new deals.

M. A. Bradley, owner of the Alva, received a dispatch from Capt. Holmes yesterday stating that the steamer now ashore on the spit off North Manitou is likely to be released by Friday. She will be taken to Chicago for bottom repairs as soon as possible after wrecking operations are through. It is the wonder of the lakes how Capt. Holmes could have landed his steamer on this well known point, and he is one of the most skillful masters afloat, as all can bear witness to.

Capt. Geo. P. McKay, manager of the Mutual and Menominee Line steamers out of this port, is having very bad luck this season, if such it may be termed. The entire fleet, with the exception of one boat, has been in trouble, and the season is yet young. Last year was little better, if any, and there is a no more discreet vessel man on the lakes than Capt. McKay. It would appear that the route between Escanaba and Ashtabula ought to be deepened in the shoaler spots, besides, masters should steer a more direct course to keep their vessels out of trouble.

Exception is taken at this end of the line to THE RECORD'S article last week on "Licensed Officers," page 10. It is said that any seaman presenting his papers in due form will be examined as to his qualifications whenever he wishes to present himself, and it is further stated that an American, whether by birth or naturalization, is eligible as a candidate for the honors of a licensed officer, whether he possesses a foreign license or otherwise. It is beyond cavil that the Cleveland local inspectors office is better administered than any other office on the chain of lakes, or if not, I would like to know of any other port that would attempt to compete with us relative to strict examination of candidates for masters, engineers and pilots licenses.

At the yards of the Cleveland Ship Building Co. work is being pushed on the large steel freight steamer building to the order of R. R. Rhodes, et al., on the channel plate system devised by the chief surveyor of the United States Standard Classification Society. Mr. James Wallace, general manager of the shipyard, says that the new steamer, which by the way is to be named the Yale, will be completed on contract time if not a little before and from the outlook at the shipyard Mr. Wallace evidently means what he says. In addition to the new ship there is a large quantity of general repair work going on, both marine and stationary, and the outlook is brisk for all departments of this extensive local industry. The engine shop, boiler works, foundry and all other branches of the firm are not only busy but rushing work to the best advantage.

DEPTH OF WATER AT LAKE PORTS.

According to bulletin No. 4 issued by the Corps of Engineers, U. S. A. relative to depths of water at lake ports corrected up to the opening of navigation this season, we find the following particulars.

LAKE SUPERIOR.

Agate Bay, Minn.—(Two Harbors). The east breakwater is now 750 feet in length and the west 200 feet this gives ample shelter during hard gales.

Ashland, Wis.—Length of breakwater at present 7,363 feet, available depth of water to ore docks, 17 feet.

Duluth, Minn.—A minimum depth of 18 feet in canal entrance and 16 feet in the older and greater portion of the harbor basin. The channel from Rice's Point to W. Superior is 200 feet wide and 16 feet deep. The North Shore channel of St. Louis Bay, which extends from the natural deep channel at Rice's Point to the deep channel at Grassy Point and the W. Duluth mills has a width of 160 feet on the straight portions, and 200 feet or more on the turns and a least depth of 15 feet. All depths are given for low water.

Eagle Harbor, Mich.—Entrance channel, 14 feet deep and 130 feet wide.

Grand Marais, Mich., August, 1894 —Showed at least a depth of 14 feet of low water, channel 200 feet wide.

Grand Marais, Minn.—Breakwater extends 350 feet, anchorage basin 23.5 acres in extent with 16 feet at low water.

Marquette, Mich.—Breakwater 3,000 feet, anchorage depth from 15 to 30 feet.

Ontonagon, Mich., July, 1894.—13 feet at low water, midway of the piers.

Portage Lake and Lake Superior Canals, Mich.—Full depth at Sault Canal except a 200 feet stretch in Portage River lacking about 4 inches from Soo Canal draft. This is being dredged out. The bar at the Lake Superior entrance silts up to 11½ feet each winter and is removed at the opening of navigation, further improvements contemplated.

St. Louis River, Minn., and Wis.—To a point five miles above Grassy Point railroad bridge and above Ironton near the outlet of Spirit Lake, 100 feet wide, 16 feet deep, above this to New Duluth, 8 feet and 6 feet to the village of Fond du Lac.

Superior, Wis.—Entrance 180 feet wide, 17 feet deep. The main channel from the entry to Connor's Point, 150 to 500 feet wide with a depth of at least 15 feet at low water, access to the docks at Old Superior 15.5 at low water, ore dock in Allouez Bay least depth 14 feet, to North-Western R. R. dock, 16 feet.

Nemadje River, January, 1894.—Least depth 10 feet. Vessels bound for West Superior now enter from the lake by the Duluth Canal.

ST. MARY'S RIVER.

Hay Lake Channel, 300 feet wide and 20 feet deep.

St. Mary's Falls Canal.—Close of season 1894, 14.63 feet. Improvement in progress for 21 feet draft at mean stage of water and a new lock 800 feet by 100 feet.

Round Island Shoals.—Channel 300 feet wide and 21 feet deep.

Little Mud Lake.—Between the lower end of Sugar Island and the lower end of "Dark Hole" 16 feet at ordinary stage, work in progress for a 300 feet channel, 21 feet deep.

Reef Abreast of Sailors' Encampment.—Available depth at ordinary stage of water 16 feet, work in progress for a 300 feet channel and 21 feet deep the same improvement being carried on 1½ miles below in Mud Lake.

LAKE MICHIGAN AND GREEN BAY.

Ahnapee, Wis., April, 1894.—Depth at entrance 16 to 17 feet and at shore end of piers about 11.5 feet, thence to the bridge about 10 feet in the southern half of the channel. These soundings are reduced to the stage of water represented on the charts. The actual stage on the date specified had 1.1 feet lower. The lowest water of January, 1895 was 2.33 feet lower. Improvements are in progress for a channel 100 feet wide and 12 feet deep up to the bridge.

Calumet Harbor, Ill.—A channel 250 feet wide and 16 feet deep, (February, 1895) believed to be practically unchanged.

South Chicago.—Illinois Steel Co.'s private harbor practicable at low water for vessels drawing 16 feet, intended to give 20 feet later.

Calumet River, Ill., and Ind.—A channel 16 feet deep to 118th street a distance of 3¾ miles, has deteriorated but is being improved. 17 feet can now be carried to 106th street, 13 feet to 108th street, from 110th to 118th street 16 feet, thence to Hammond, Ind., not exceeding 6 feet can be carried.

Cedar River, Mich., April 20, 1894.—Narrow channel 14.5 feet. The lowest water January, 1895 was 2.33 feet lower. Work at the harbor has been suspended since 1885.

Charlevoix, Mich., January, 1895.—Width of piers at entrance, 160 feet narrowing to 100 feet at shore ends, available depth 12 feet. The same draft through the upper channel.

Chicago Harbor.—Entrance from 18 to 32 feet. The outer harbor was dredged to 16 feet but has since filled irregularly leaving reliable depths of from 14 to 15 feet at low water. The inner or 2½ mile crib off 12th street has been torn down but the crib below the water remains and is a dangerous obstruction to navigation.

Chicago River.—The south branch and main river from Rush to Lake street, 17 feet; Lake to Fuller street, 16 feet; 15½ feet to Iron street, 13 feet to Ashland avenue, 11 feet to head of navigation. On the north branch 16 feet to Clybourne Place; 15½ feet to Fullerton avenue and 14 feet to Belmont avenue the head of navigation.

Chicago River Entrance.—This channel has shoaled, but 18 feet at extreme low water can be carried to the first bridge.

Frankfort, Mich.—When navigation closed last season there was a narrow entrance channel with a least depth of 13 feet increasing to 15 feet inside. The piers will be extended this year.

Grand Haven, Mich.—On Dec. 23, 1894, the least depth in southern crossing of the outer bar was 19 feet; shoalest depth on bar being 14½ feet; channel depths between piers near entrance, 16 feet, further inside 20 feet, or more.

Green Bay, Wis., June 18, 1892.—A channel 200 feet wide, 15 feet deep was completed. The lowest water in January, 1895 was 2.33 feet lower. Improvements are in progress for a channel from Green Bay to the mouth of Fox River 200 feet wide, 16 feet deep and 16.500 feet in length.

Holland (Black Lake) Mich., January, 1895.—Channel dredged last year to 75 feet wide, 16 feet deep usually shoaling in winter to 7 feet and dredging is needed to re-open it. The United States dredges commenced June 3, to make three cuts through the harbor, 14 feet deep.

Kenosha, Wis., July, 1894.—Channel 60 feet wide and about 15.5 feet deep reduced to chart soundings. The lowest water of January 1895, was 2.33 feet lower. Improvements in progress for a 15 feet channel.

Kewaunee, Wis., April 12, 1894.—Entrance 14.5 to 15 feet deep. January, 1895, 2.33 feet lower as reduced to the stage of water represented on the charts. Work is in progress to maintain a clear 14 feet between the piers.

Ludington, Mich.—Available depth between piers November, 1894, 15½ feet.

Manistee, Mich., January, 1895.—Depth at entrance 16 feet and in Manistee River 13 feet.

Manistique, Mich., May, 1892.—Channel 100 feet wide. 14.4 deep between the piers and about 12 5 on the outer bar. The lowest water of January, 1895 was 2.33 feet lower, reduced to the stage of water given on the charts. Government work on this harbor was suspended in 1881 and has not been resumed.

Manitowoc, Wis., November, 1894.—Channel 90 feet wide between the piers and a depth of about 17 feet reduced to soundings given on the charts. The lowest water in January, 1895 was 2.33 feet lower. It is intended to maintain this channel and construct a breakwater.

Menominee Harbor, Mich. and Wis., Oct., 1894.—A channel 200 feet wide and 17 feet deep. Jan., 1895, 2.33 feet lower according to soundings given on the chart. It is intended to maintain a 16-foot channel.

Michigan City, Ind., Jan., 1895.—Navigable depth at entrance 18 feet and in inner harbor 12 feet, temporarily increased by dredging to 13 feet.

Milwaukee Bay, Wis.—Harbor of Refuge contains an anchorage area of 417 acres beyond the 18 foot contour, with a maximum depth of about 36 feet, reduced to chart soundings. The lowest water Jan., 1895 was 2.33 feet lower.

Milwaukee Harbor, Wis., Dec. 1894.—Channel 19 feet deep, 80 feet wide. Jan., 1895, 2.33 feet lower. It is intended to maintain an 18 foot channel between the piers.

Muskegon, Mich., January, 1895.—Available depth at entrance 20 feet, diminishing to 14 feet in channel between the piers with 15 to 20 feet at head of landing piers.

Oconto, Wis., Sept. 1894.—Channel 10 feet between the piers, and up to Spies Mill 7.5 feet reduced to the chart stage of water. January, 1895, 2.33 feet lower. It is intended to form a channel 100 feet wide and 8 feet deep from Green Bay to Oconto a distance of about 2 miles.

Pensaukee, Wis., May, 1890 —The depth was 3.8 feet. The formation of a channel 100 feet wide and 10 feet deep by the construction of one pier and dredging, was suspended in 1883 and no dredging has been done since.

Pentwater, Mich., Nov., 1894.—10 feet between the piers will be increased by dredging this season.

Petoskey, Mich.,—Depth at landing pier at present stage of the lake, 14 feet. A breakwater will be commenced this season.

Portage Lake, Mich.—At entrance the depth of water does not exceed 7 feet. A temporary channel for about 10 feet will be made early this season but it will soon fill up again. Depth in Portage Lake ample for deepest draft.

Port Washington, Wis., March, 1894.—Entrance channel was 11 feet deep. The north basin and the north half of the west basin have a depth of from 11 to 13 feet. The south half of the west basin averages about 5 feet deep reduced to chart soundings. The lowest water Jan., 1895, was 2.33 feet lower. It is intended to form an entrance channel 12 feet deep between piers 150 feet apart, connecting with north and west basins of same depth.

Racine, Wis., May, 1894.—Channel 60 feet wide and about 15 feet deep. May have shoaled since. Improvment in progress for a 16-foot channel between piers 160 feet apart.

Saugatuck, Mich.—Piers dilapidated, depth between same only 7 feet and inside still less.

Sheboygan, Wis., Nov., 1894.—Channel between piers 17 feet reduced to chart soundings. The lowest water Jan., 1895, was 2 33 feet lower. Dredging is in progress for a channel 270 feet wide and 18 feet deep.

South Haven, Mich.—Frequent dredging required to maintain a depth of 12 feet between piers and river.

Sturgeon Bay Canal, Lake Michigan Entrance, Nov., 1894.—About 17 feet reduced to chart soundings. The lowest water Jan., 1895, was 2.33 feet lower.

Sturgeon Bay Canal, Green Bay, Sept., 1894.—Depth 14.5 feet for a width of about 70 feet.

Two Rivers, Wis., Nov., 1894.—The channel had a depth of about 13 feet, 120 feet in width, narrowing to 75 feet at the bar. The best water is near, but not close to the north pier. It is intended to maintain a 12-foot channel 240 feet in width.

Waukegan, Ill., April, 1894.—Eleven feet, some shoaling has probably occurred since then. A 12-foot entrance channel is projected.

White Lake, Mich., Jan., 1895.—Depth at entrance 11 feet, shoaling to 8 feet a short distance inside.

(CONTINUED IN OUR NEXT.)

LAKE LEVELS.

In accounting for the present low stage of water and defending his opinion that the deepening of the Lime Kiln channel does not lower the lake level, Gen. Poe is reported in the Detroit *Free Press* as advancing several statements that seem well nigh unanswerable. He begins by saying that the rainfall since February 1 on the water sheds of the Great Lakes has been several inches short on the average for this time of year. When there is no rain the weather is always clear and the evaporation is necessarily quickened with the sun unobscured. The rainfall, therefore, works in two ways to raise the level of the lakes, for when there is rain the sun is obscured. To make up the difference we must have much more than the normal fall of rain from now to autumn.

There are some people who say that the deepening of the Lime Kiln crossing is responsible for the low water, they claiming that the deeper the cut the less the friction which tends to hold back the water. He admits that this is true, but says the difference in the flow of water is infinitesimal when compared with the great amount that goes through. The general can and has given an elaborate explanation why this is so, but he asks two questions that will effectually squelch these theorizers, who also claim that the water has been on a steady decline since 1886, and that there is no prospect in view of the deepening of channels that is now going on, that it will ever rise again. In 1838 the lakes showed what is considered the standard high water mark, and which is always used as a basis in computing water levels. The stage of water that year was 5½ feet higher than in the year 1847; when it fell to the low water mark. The water in the latter year was about ten inches lower than it is to-day. How, asks the general, is this to be accounted for except by the natural law of precipitation and evaporation? There was no howl made about low water that year and no wise theories were expounded to account for it, for the reason that the commerce then was very small. Give us the rainfall of three years ago, when we had three days of dry weather in May and five days in June, and the level of water will go up a foot or two and all complaints and theories will cease. The general asks one more question: If the level in the Detroit River, St. Clair River, Lake St. Clair and Lake Huron is lowered by the deep channel at the mouth of the river, why do not the levels in Lake Erie and all its harbors show a corresponding increase? They do not.

MAIL YOUR MANIFEST.

It would be well to remember that beginning July 1st, all vessels trading between America and foreign ports must mail a copy of their manifest to Washington. The instructions are as follows:

Section 9. On and after July first, 1895, each master of a vessel arriving in the United States from a foreign port, except vessels carrying traffic in bond on transfer ferries shall, immediately upon landing and before entering his vessel at the custom house, mail to the Auditor for the Treasury Department, Washington, a true copy of the manifest of his vessel, and shall on entering his vessel make affidavit that he has mailed such copy and that the same is true and correct; and he shall also mail to the said auditor a true copy of the corrected manifest filed on any post entry of his vessel. Any master who neglects or refuses to mail to the said Auditor the required copy of the original or corrected manifest, shall be subject to the same fines and penalties fixed by law for his refusal to deliver the manifest of his vessel to the collector: Provided, That this section shall not apply to ports where there is a naval officer.

Envelopes with the address of the Auditor of the Treasury Department, an official frank, and instructions printed thereon, will be furnished by the local Custom House officials.

CORRESPONDENCE.

☞We do not hold ourselves responsible in any way for the views or opinions expressed by our correspondents. It is our desire that all sides of any question affecting the interests or welfare of the lake marine should be fairly represented in THE MARINE RECORD.

STEAMERS' FOG SIGNALS.

PORT DALHOUSIE, ONT., June 5, 1895.

To the Editor of The Marine Record:

I found on Lake Huron, this trip, in fog, that single American steamboats gave three blasts of their steam whistle. Can you tell me how a man in charge is going to know whether a steamboat has a tow of vessels or not when the same signals are given for a tow? The past seasons it was one prolonged blast for single boats and three for a boat with a tow. On these signals men knew what to do to get past each other by giving one short blast to the boat on his port bow to keep to the right or starboard, and two short blasts to the boat on his starboard bow to keep to the left or port side. The boat giving the signals would do the same. I have not seen or heard of any trouble in getting past when these signals were given distinct and understood. I have had several interviews with marine men about these new American fog signals; also with men that are not in anyway interested in boats. They all thought it was a very dangerous thing to alter the fog signals, and it would cause a great many collisions and loss of life life and boats, also to insurance companies that have boats insured. Then was it considered that from Amherstburg to Point Perle the navigation is as heavy as anywhere on the lakes, and that it is Canadian waters when boats are passing about all the time, and I understand that these new signals have nothing to do with Canadian waters or Canadian boats in these waters or American boats in Canadian waters. I for one think the sooner these new fog signals are done away with the better for all concerned. Yours respectfully,

WM. MANSON,
Master steamer "Tecumseh."

DOUBLE FOG SIGNALS.

CHICAGO, June 4, 1895.

To the Editor of The Marine Record:

Any thinking man must reason out for himself the cause of the many recent collisions on the lakes but I believe that the change in the fog signals this season without due advertisement of the changes intended is responsible for considerable of the trouble.

I would suggest a double code of signals, say the usual steam whistle for steamers bound up and a screeching whistle or at least something different to the ordinary for vessels bound down. We could not use the Modoc as that alone is for raft towing purposes but it would be an easy matter to arrange a mechanical contrivance differing from the usual steam whistle.

In the case of the Norman and Jack on Lake Huron last week it seems to me that the Jack expected to pass a vessel going the same way and this, in a great measnre caused the collision as she was on nearly opposite course. The RECORD pointed out last winter that the majority of lake tonnage were either on opposite or parallel courses now if the double fog signal system was introduced it would surely be a factor of safety in thick weather, as it would partly denote, and in many cases exactly so, the courses each vessel was steering.

There is a great channel of danger in hastily changing rules which we have all followed for so many years, but now that we have the new code we must live up to it as closely as possible. Another thing I would like to say is, that if the new laws are followed to the letter no serious collision can take place without evident carelessness. I want to hear from others what is thought of the up and down bound fog signal system which I have thought worth while bringing to the attention of the lake marine and it is a simple change which all could understand besides the rule might easily be added if only optional or a recommendation to owners that their vessels be so equipped.

ONE WHO IS AT IT.

QUALIFICATIONS FOR CANADIAN LICENSES.

KINGSTON, June 5, 1895.

To the Editor of The Marine Record:

No one of your numerous readers peruses your valuable paper with more interest than I do, and knowing how anxious you are to be correct in all your statements, will you allow me to call your attention to the latter portion of an article in your issue of 30th ult., entitled "Licensed Officers." I do not wish to say that your statement is incorrect, but it at least appears somewhat misleading. You state as follows: "The facts are that in the Dominion of Canada as well as in the mother country, the question of naturalization never comes up in any form—all that is required from a candidate, be he a South Sea Islander or a Hottentot, or, in a word, an alien is a skillful competency in his trade or profession, and the certificate when granted vouches for this alone. There are no moral, physical or national obligations entered into at all, as the result of the examination is simply to determine technical qualifications." Now, sir, the law governing this is found in Section 4, Chap. 42 of 57–58 Vic., and is as follows: "Examinations may be instituted in Canada for British subjects or for persons domiciled in Canada for at least three years who intend to become masters or mates of ships trading on the inland waters of Canada or on the minor waters of Canada, or on coasting voyages, or who wish to procure the certificates of competency or service hereinafter mentioned; and foreign subjects serving in ships registered in Canada and trading on the inland waters of Canada, or on the minor waters of Canada, or on coasting voyages shall be deemed to be domiciled in Canada while so serving." The same law is quoted in Section 2, of the Act, with reference to masters and mates of seagoing ships. The applicant must produce his testimonials of service and according to Rule 38, "the testimonials of service of foreigners and British seamen serving in foreign vessels must be conformed either by the Consul of the country or some official authority, etc. In the application form the candidate makes a declaration that his testimonials are "true and genuine documents and that the particulars are true." Then the Act also provides for the punishment of any who fraudulently assist in procuring a certificate for himself or any one else by false representation. The candidate must produce "testimonials of sobriety, character, experience, ability and good conduct on board ship and without producing them no person will be examined (vido Rule 38) and as regards 'physical obligations' the candidate must prove that he is not color blind."

I do not contend, sir, that the Canadian Act is all it might be, but my opinion is that if its provisions are properly carried out in the examination of candidates, the result must be an improvement in the standard of lake officers and this is very much to be desired. THE MARINE RECORD deserves the thanks of every one interested in the lake marine, for the noble efforts you are always putting forth toward this end, and if a greater number of our Canadian mariners would read your columns more closely, the service would be greatly benefitted thereby.

THOS. DONNELLY,
Examiner of masters and mates.

SKY PILOTING.

A balloon equipped with self-registered instruments to measure the temperature and pressure of the atmosphere at high altitudes was recently experimented with in Berlin and came down, with the instruments in good condition, in Bosnia. The instruments showed that the balloon had reached an elevation of 53,872 feet over ten miles; the thermometer had fallen to 52 degrees below zero—the lowest it could record. Another balloon, sent up later is stated to have reached an elevation of 72,000 feet above the earth, or thirteen and a half miles.

LIFE-SAVING APPARATUS.

Many new devices intended for the use of the life-savers have been displayed in the federal building, Boston, Mass., this week.

The board of examination of life-saving appliances has been in session since Monday and will propably be busy a day or two longer.

The board is composed of the president, Prof. Cecil H. Peabody, Massachusetts Institute of Technology; recorder, Lieut. Byron L. Reed, U. S. revenue cutter service, assistant inspector life-saving stations, Washington; Capt. Chas. A. Abbey, U. S. revenue cutter service, inspector life-saving stations, New York; Capt. David A. Lyle, ordnance department, U. S. Army, Philadelphia; Benjamin C. Sparrow, superintendent 2nd life-saving district, East Orleans, Mass., Jerome G. Kiah, superintendent 10th life-saving district, Sand Beach, Mich; Herbert M. Knowles, assistant superintendent 3d life-saving district, Wakefield, R. I.; Mr. S. I. Kimball, general superintendent of the life-saving service, is also present, at the meetings of the board.

Altogether 22 proposed improvements for apparatus and boats have been submitted and carefully investigated. The number of propositions has not been as large as formerly, but they are generally of a more practical nature, and not so widely experimental as they have been in the past.

Under the classification of wreck ordnance was presented: Method of taking shot lines (Gilbert); Schmitt's device for throwing shot lines; line throwing gun.

Under boats and miscellaneous appliances were considered: Steam or electric lifeboat; hydraulic steam lifeboat; Fleck's lifeboat; Potter's metallic lifeboat, with electric motor; Finch's steam lifeboats; Redmond's improvements in lifeboats; Walker's hydraulic propulsion of vessels; Mayo's improvements in life car; spool for preventing fouling of hawser; Mayo's improvments in buoy block; Raymond's automatic boat detaching device; line-carrying kite; African cork wood for life preservers; Sherry's illuminating torch; the Graham-Meyer signaling torch; improved Coston signal holder; shell for distributing oil on rough sea; insuflator for restoring suspended animation.

The board went to Nantasket and witnessed an exhibition given by Mr. Meyer of the Graham-Meyer illuminating and signaling torch which was very interesting. Mr. Meyer gave experimental tests of his torch light on the lakes a few weeks ago.

AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation. A second bearing of the sun may be taken at sunset by reversing the bearings to read west instead of east, as, for example, N. E. by E. for a sunrise bearing would read N. W. by W. for a sunset, or E. 30° N. to W. 30° N.

LAKE ERIE AND S. END LAKE MICHIGAN, LAT. 42° N.

Sunrise.	Bearing (degrees).	Bearing (points).
June 9	E. 32° N.	NE. by E. ⅛ E.
June14	E. 32° N.	NE. by E. ⅛ E.

LAKE ONTARIO, S. END HURON AND CENTER LAKE MICHIGAN, LAT. 44° N.

Sunrise.	Bearing (degrees).	Bearing (points).
June 9	E. 33° N.	NE. by E. ⅛ E.
June14	E. 33° N.	NE. by E. ⅛ E.

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.

Sunrise.	Bearing (degrees).	Bearing (points).
June 9	E. 34° N.	NE. by E.
June14	E. 34° N.	NE. by E.

LAKE SUPERIOR, LAT. 48° N.

Sunrise.	Bearing (degrees).	Bearing (points).
June 9	E. 36° N.	NE. ⅞ E.
June14	E. 36° N.	NE. ⅞ E.

With a compass correct magnetic, the difference between the observed and true bearing will be the variation for the locality. If there is any deviation on the course the vessel is heading at the time of taking the bearing, the result after the variation is applied will be the amount of deviation on that course.

INLAND LLOYDS' SUPPLEMENT.

Capt. Dan McLeod, manager of the Inland Lloyds has just issued supplement No. 2 to the Inland Lloyds' Vessel Register for 1895. The supplement contains revised ratings, etc., of 2 side wheelers, 36 propellers, 7 tugs, 23 schooners, and 28 barges.

The new vessels appearing in the list are as follows: propeller Argo, 700 tons, built at Detroit, owned by C. R. Jones and others, value $70,000, class A 1*; Chili, 1,845 tons, built at Cleveland, M. M. Drake and others owners, value $150,000 class A 1; Linden, 709 tons, built at Port Huron, S. B. Jenks Co., owners, value $65,000 class A 1*; J. J. McWilliams, 2,800 tons, built at West Bay City, owned by Mitchell and others, value $175,000, class A 1*; J. Watson Stephenson, built at West Bay City, owner F. W. Wheeler Co., value $60,000, class A 1*; John B. Trevor, 1,318 tons, built at West Superior, American Steamboat Co., owners, value $130,000, class A 1*; schooner Granada, 1,644 tons, built at West Bay City, owned by Davidson, value $75,000, class A 1*; schooners Malta and Marcia, each 2,132 tons, built at South Chicago, Minnesota Steamship Co., owners, value $100,000 each class A 1.

THE MARINE RECORD

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CLEVELAND, O., JUNE 6, 1895.

MAJ. M. B. ADAMS, Corps, of Engineers, U. S. A. requires bids on the construction of Round Island light station, Straits of Mackinac. Builders and iron manufacturers are asked to submit proposals.

THE N. Atlantic pilot chart for June issued by the Hydrographic Office, Navy Department, Washington, is fully up to the usual excellent delineations published by that department and which has attained a world wide reputation.

THE best chart that has ever been issued of the Detroit River has just come to hand from the Hydrographic office. Masters and pilots who desire to keep thoroughly posted should at once secure this excellent delineation compiled by sailors for sailors.

THE depth of water at St. Mary's Falls canal, the gateway to Lake Superior, has been so low during the early portion of the season that the majority of vessels were debarred from loading within several hundred tons of their ordinary capacity. This week, the water having been steadily but slowly rising, has passed the fourteen foot limit by three inches, a rise of seven inches since the opening of navigation. It is quite likely that this depth will be increased during the next few weeks, a feature which will mean the transportation of a great deal more cargo and corresponding earnings for vessels engaged in the Lake Superior trade.

TWO more large wooden steamers, dimensions 350 by 43 feet, will be launched from the yards of Capt. James Davidson, Bay City, Mich., in a few days. Besides being a builder of some of the best wooden tonnage afloat on the lakes, Capt. Davidson is also a shipowner and manager. He recently contracted to transport 100,000 tons of ore from Lake Superior and will place the new vessels in that trade as early as possible, disposing of them afterwards as opportunity offers. Capt. Davidson believes in building on speculation and his shipyard is kept busy even when there are no contract orders on hand. A modern steel plant will be added to the shipyard this year, so that metal as well as composite tonnage may be constructed.

THE system of communicating with the shore from outlying stations, such as light-ships, light-houses, life-saving stations, etc., by electricity, has now been practically demonstrated and can be made a success if adequate means are furnished for the equipment. The Light-House Board up to the present has done everything in its power to prove the adaptability of the new tests and inventions and with a grant from Congress several of the most important districts might be connected with the shore. An appropriation of $150,000 for this purpose has frequently been asked from congress, but hitherto without avail. The fact that an electrical expert has established communication between the Scotland light-ship in New York Bay and Sandy-Hook, ought to have a bearing with the next congress in voting the supplies necessary to carry out the plans of the Light-House Board in connecting by telegraph or telephone outlying stations.

LAKE CHARTS.

An eminent authority on charts writing to THE RECORD, says: "With the rapid change in the variations of the magnetic needle, which must be experienced by vessels traversing the lakes, involving very frequent corrections of compass courses, with the use of iron vessels, with cargoes of varying magnetic quality producing further deviation of the compass needle, it is of doubtful expediency to furnish lake charts on the polyconic projection for navigating purposes. On those charts of the lakes a straight line represents practically a great circle track. A great circle track looks very simple on such a chart, but to follow it requires a varying course; in other words, a vessel traversing the great circle must change her course frequently. With varying courses, varying magnetic "variation" and varying magnetic quality of cargo, surely the lake navigator must have his brains taxed unduly. A well-known civil engineer, who has since written for publication on the question asked, recently, why it was that a vessel steering from one port to another on the Great Lakes should usually bring up a number of miles to one side of her port of destination? The gentleman, although well informed on nautical questions, inferred that it was due to some peculiar magnetic property of the lake region, whereas it was only due to an unnoticed property of charts on the polyconic projection. The Mercator projection continues to be the projection par-excellence of navigators.

The foregoing from so able an authority as our correspondent gives the credit which is loyally their due to lake pilots and navigators and it is safe to say that there are few men in charge of iron or steel steamers on the lakes who have not met with the experience so tersely pointed out in the above extract.

In wooden tonnage, a well-made compass, fairly placed and tolerably adjusted has no doubt indicated magnetic courses season after season and therefore an undue reliance came to be placed on the "sea clock." However, as we have frequently taken occasion to state, a new era was ushered in with the building of metal tonnage and the departure was accordingly fraught with new corrections to be applied on courses, for, let it be understood that these corrections are not errors in the proper sense of the word, rather should we say that if they did not exist the compass would not be working in harmony with its surroundings, according to the laws of magnetism, and in this event only, could the usual corrections be termed errors and the courses indicated erroneous.

The importance of determining exactly how a vessel may be coming over the ground is more distinctly borne in upon us at this time on account of a remark dropped by a shipmaster, within a few days, wherein he partly blames the compass adjusters for adding errors on corrections. The statement was made "that before compass adjusters plied their calling on the lakes, all possible dependence was placed on their compass courses, but that it is very mnch different now as chart courses can no longer be steered." We believe we have frequently made it clear that the difference lies in a change of conditions, and not by any means through the influx of adjusters. As an iron ship requires more skill to handle safely, in so far as the shaping of courses are concerned, so are the men in charge of them expected to exceed in ability the masters in charge of wooden tonnage. To this end we would suggest that the steamboat inspection service requires, all metal steamers to keep a deviation card closely posted up during the season of navigation and that all candidates seeking first, or, as it is termed, original licenses for master or pilot, should be examined as to their knowledge of converting compass courses into corrected, magnetic or true courses and vice versa. We should then hear less talk of steering true, chart, or geographical courses as indicated by a magnetic instrument, a feat which some pilots are yet strongly of the belief may be accurately accomplished, even where east or west variation amounts to a handful of degrees and totally irrespective of any deviation which may exist on any particular courses. In plain terms we may say that a magnetic instrument properly adjusted, etc., indicates the direction of the magnetic poles and not the true or geographical poles.

TWO collisions occurring within a few days of each other on the lakes involving besides the loss of four lives about half a million dollars worth of floating property calls for prompt and decisive action to be taken so as to learn the cause or causes leading up to the casualties and to take steps to obviate such dire losses in the future. From present information, and in advance of any inquiry being made relative to the actual orders executed prior to the vessels coming together it is palpable that a mis-understanding of whistle signals was mainly responsible for the losses. Lake pilots and navigators are entitled to an official ruling on these collisions at the earliest possible date, so that if there is a weak spot in the "rules of the road" when sailing in a fog, they may be forearmed by being forewarned. Two comparatively small lumber laden steamers collide with two 3,000 ton modern built steel steamers and the metal boats founder in deep water beyond the chance of recovery or even salvage. The question now is how did this quartette of vessels get together and how best might they have avoided the trouble. A comprehensive decision relating to these points would do much to prevent further loss of life and property on the lakes.

ANENT the recent newspaper discussion and quoted interviews between vessel owners, tug managers, masters and others using the waterway below Buffalo, Major E. H. Ruffner, Corps of Engineers, U. S. A., stationed at Buffalo, in charge of that district, announces that Niagara Falls has entered the list of lake ports. The third cut is finished in the dredging operations at Connor's Island. This gives the channel 50 feet wide at the bottom and with a full depth of 14 feet at mean lake level, through the bar, and the harbor behind the island is now accessible for craft that do not draw more than 12 feet at mean lake level. Such vessels pass down on the west of Grand Island, and on the east of Navy Island, around the foot of Grand Island, then rounding to port in time to hug closely the buoys, marking the new channel on its eastern side. Until the channel is widened to its full width vessels must go very slowly and follow the line precisely.

Now that an adequate passenger service by water between Buffalo and Duluth has been established, J. J. Hill, of the Great Northern railroad, will no doubt turn his attention to a trans-Pacific route and collar some of the Japan and China trade for his continental railway. Having a terminus at Duluth, a large portion of this eastern commerce ought to be tributary to the lakes, as it no doubt will be in the near future. It is quite certain that Mr. Hill did not build the Great Northern as far as the stepping-off place on the Pacific coast and at a location away back of behind of nowhere to allow it to fossilize. A line of steamers across the N. Pacific and to tap the California coast is now wanted to connect with the western terminus of the Great Northern railroad.

CONGRESSMAN HERMANN, of Oregon, a member of the House committee on rivers and harbors, is making a tour of the lakes this week from Buffalo to Duluth enroute for home. Mr. Charles H. Keep, secretary of the Lake Carrier's Association, accompanied the congressman, who was warmly received by a delegation of vessel-owners at each port. While at Detroit, Mr. Hermann complimented Gen. O. M. Poe, Corps of Engineers, U. S. A., in a few well chosen words and referred to him as one of the greatest engineers in this or any other country, a sentiment which was warmly endorsed in a later speech by Gen. Alger and other members of the Detroit delegation. We would like to add that Gen. O. M. Poe is thoroughly appreciated by all lake interests.

NEW TONNAGE.

The Bureau of Navigation assigned official numbers to the following new lake tonnage during the week ending May 25, 1895; Steam—Chili 2584, gross and 1845 net tons, Buffalo, built at Cleveland; Myron W. Moyer 14 tons, Buffalo; Sail—Mistral 33 tons, Chicago.

FAVORS FREE FISHERIES.

Sir Charles Tupper, Canadian Minister of Marine and Fisheries, announces that he favors removing the restrictions on fisheries, and throwing them open, without license fee, to Canadians and Americans alike, provided the United States would agree to reciprocate in the matter of allowing the sale of fish and farm products from Canadian small boats.

The Canadian government has shown its sincerity in this matter by abolishing its $5 per season fishing lisense at the Thousand Islands, and making the privilege absolutely free, to all, regardless of nationality, in that region.

NEW SYSTEM OF CHARTING.

BRANCH HYDROGRAPHIC OFFICE,
CLEVELAND, June 5, 1895.

We desire to call attention to the following notice in regard to the Hydrographic office chart. No. 1489, of the Detroit River and vicinity. The system spoken of is new to the nautical practices of the Lakes. It has been found from trial to be of the greatest benefit to enable the navigator to quickly and positively locate all dangers in his vicinity, and to choose the best possible channel for the passage of the vessel under his command. The office invites criticism of this chart.

NOTICE:—Special attention is called to the new system inaugurated by the Hydrographic Office of indicating depths of water by the use of different shades of blue. As in actual practice the water which shows the greatest discoloration is usually the shallowest; so on this chart the deepest shades of blue indicate greater and safer depths. By inspection of the chart it will be seen that the white or untinted portion indicates 18 feet or more, light blue, 18 feet to 12 feet, medium blue, 12 feet to 6 feet, and dark blue, under 6 feet.

This method will be used in all the Sailing Directions of the Great Lakes. (See H. O. No. 108, Parts 1, 2, and 3.)

W. L. COLE,
Ensign U. S Navy, in charge.

FREIGHT REPORT.

It is a pleasure to chronicle a general improved outlook for lake business in volume and freights. Since our last issue a five-cent raise on ore has been made all round and 85 cents from the head of Lake Superior, 75 cents from Marquette, with 55 from Escanaba are now the going rates for daily charters which, by the way, ought to exceed at all times the season chartered rate. Coal charters are yet slow and quiet, but a disposition is evinced among vessel owners to obtain a fair freight on coal or to go light as it is by no means just to ask entire earnings from cargo moving eastward; A number of charters have been placed this week for Ohio ports at 35 cents to Lake Michigan and 30 cents to Lake Superior, some getting 35 cents to Duluth, while the Buffalo rate to the head of the lakes has advanced to 20 cents.

Lumber rates are firm and $2 per M feet is looked for from Duluth.

Grain has been placed at Chicago for 2⅝ cents to Kingston, an advance of ⅛ cent from last quotation; corn to Bugalo 1¼ cents; Port Huron corn and oats 1⅛ cents to 1 cent; Toledo wheat at 1½ cents. The nominal rate from Duluth to Kingston is 3⅝ cents, but charters were made this week at 3¼ cents. Chicago wheat to Buffalo 1½ cents; oats 1⅛ cents; corn 1¼ cents. Ogdensburg, 2⅛ cents on oats, and 1½ cents to Toledo.

NICKEL STEEL FOR BOILERS.

Some time ago the government asked bids for some of the leading steel makers on 20,466 pounds of steel to contain not less than 3 per cent of nickel and to meet specifications as follows: Tensile strength 80,000 pounds elongation of at least 25 per cent in 8 inches and an elastic limit of at least 50,000 pounds per square inch. Owing to the very rigid requirements, only two firms bid on the work, these being Carbon Steel Co. and Carnegie Steel Co. limited, both of Pittsburgh. The Carbon Steel Co. were ready to guarantee an elongation of 25 per cent in 2 inches instead of 8 inches and consequently their bid, being informal, was not considered. The work was placed with the Carnegie Steel Co., Limited, at 5¼ cents per pound, delivered, Washington, D. C. The plate is about 1⅓ inches thick and is for the armored cruiser Chicago, which is to have an entire new set of boilers. The firm rolled eight plates but these were rejected on three different inspections as not coming up to specifications. On the fourth test one of the plates is said to have showed a tensile strength of 86,000 pounds to the square inch and to slightly exceed the severe requirements in reduction of area and elongation. The Carnegie Steel Co. are to be commended for the courage they showed in agreeing to furnish material of the rigid specifications asked, and the fact that they have had a number of rejections does not take away any of the credit that is due the manufacturer. Should it be conclusively proven that nickel steel can be successfully used in the manufacture of boilers and can be furnished at a reasonable figure, it will mean a very large consumption of this class of material. Considerable interest is being manifested in the result of the tests of the balance of the plates by boiler makers and steel makers as well.

THE CANADIAN SAULT CANAL.

The Canadian government has arranged for the official opening of the Sault canal on Thursday, June 13. Both sides of parliament will be well represented at the opening. A special train will carry the members of the government, members of parliament and gentlemen of the press to Sault Ste. Marie, Ont.

The leaders of both political parties will deliver addresses at the banquet to be held in Sault Ste. Marie. All are united as to the commercial and strategic necessity for the canal, and the affair will be very harmonious.

The big lock is 900 feet long by 60 feet wide and has 20 feet of water over the miter sill. Its cost will aggregate something over $4,000,000.

ST. MARY'S FALLS CANAL COMMERCE.

The following comparative statement of the commerce east and west bound through St. Mary's Falls canal, Michigan, for the month of May, seasons of 1894 and 1895, is rendered by the officials in charge:

EAST BOUND.

ITEM.	DESIGNATION.	1894.	1895.
Copper	Net tons	16,418	18,227
Corn	Bushels	531,268	.....
Building stone	Net tons	2,563	2,905
Flour	Barrels	1,126,175	1,428,853
Iron ore	Net tons	888,466	1,045,129
Iron, pig	Net tons	4,045	6,983
Lumber	M. ft. b. m.	87,687	87,159
Silver ore	Net tons	372	.....
Wheat	Bushels	3,880,024	4,662,390
Unclassified freig't	Net tons	15,468	11,002
Passengers	Number	818	917

WEST BOUND.

ITEM.	DESIGNATION.	1894.	1895.
Coal, anthracite	Net tons	52,133	48,138
" bituminous	Net tons	16,372	38,893
Flour	Barrels	717	150
Grain	Bushels	500	10,250
Manufactured iron	Net tons	3,597	11,128
Salt	Barrels	18,718	56,312
Unclassified freig't	Net tons	35,878	43,196
Passengers	Number	726	904

East bound freight, net tons	1,525,712
West bound freight, net tons	150,169
Total	1,675,881

FLOTSAM, JETSAM AND LAGAN.

The handsomest steam yacht that was ever built in Baltimore will be launched Saturday afternoon. She is a wooden vessel 189 feet long, 21½ beam and 13 deep. She will draw ten feet of water. When completed her total cost will be nearly $50,000. She is being built to the order of A. Chaudon, of New York, a Standard oil magnate, and her name will probably be the Pilgrim.

A curious atmospheric phenomena was observed by the keepers at Little Point Sable light-house, east shore of Lake Michigan, on the night of April 17th, between 10 and 12 o'clock. A cluster of about thirty different lights was distinctly visible on the horizon a little to the north of west. It was the first nocturnal mirage ever seen at that point. Undoubtedly the lights seen were those of the city of Sheboygan, Wis.

A novel appliance is being fitted in a small boat by Thomas Langell, Marine City, which is expected to drive her eight to ten miles an hour. A two-bladed "Trout" propeller wheel is to be worked by hand power and the mechanism as at present arranged permits of about 300 revolutions per minute. The experiment is being watched with much interest and as the boat is to be placed in the water in the course of a few days, it is expected that oars and row-locks will soon be superseded.

The Baker sub-marine torpedo boat built in Detroit three years ago was towed out into the lake at Chicago last week and allowed to founder. In 1892 the tug Swain towed the torpedo boat from Detroit to South Chicago, Capt. Baker, the inventor, had designed it for exhibition at the World's Fair. The several test trips he made in it proved that she would go under water for a long distance. Capt. Baker afterwards went to Washington with assurances that the government would take the boat off his hands and order others like it. His anticipations were never realized, and it is said that disappointment and chagrin hurried him to his grave. It would now be in order for another genius to take up the invention where Capt. Baker left off and make a world astounding success of it.

CHARACTERISTIC-FRENCH-CANADIAN.

ALGNACK, MICH., July 4th, 1895.

Monsieur Edditare of Marine Reccor, Cleveland:

DER SUR:—i been tole by fren for rite on you for get hinformashun on wat i want no. now wat i want no i gone tole you puty quick i hone to scow an i been charter dem to scow for cary cord hood an pale bolt from swan crick to Toledo for hall dis sumer an i been try to fine some wan wats got steam bote wat want de job to tow dun scow i been rite letter on Capt. Dulac wat liv on Mont Clemens i here she got to tree bote an i tot maby she will like to get de job to tow dun scow wat i got but I got letter from her, an she say on her letter dat her bote was hall charter an she hant got no tam to tow my scow bot on sam tam she tole me dat was feler wat live on Cleveland es nam was Bill Mack an she got to big bote i was gon rite on him but I was frade she hant go on pos hofis an she hant gone get my lettur an dat's de resun wat i rite on you i want you to fine dat feller Bill Mack an tole her wat I want an you can tole her one of dat scow wat i got es big wan she gis boot like de scow Jule La Plant wat was loss on Lack St. Clair long tam ago i spose you remember dat dar was some feler wat compos song on her and cook wat was loss his nam was *Angeline* wel dat was my firs cosin an he was a good wan an we hofen talk boot him yet. an you kin tole Bill Mack dar was plenty water to go on swan crick i been try de water an i cant tuch botom wid plack pole an you kin tole her dat i see Jaque La Turneau de odder day an she tole me fi i kin git bote to tow my scow she kin sel her cord hood for make steam for one dolar cord. i no hall dem feler wat live on Swan Crick da gone be glad fi i kin git dat bote cos da hant see big bote come on dis plas for long tam an John Tebo she was Superviser an she say wen de bote com she gone have de bras ban on de dock. i no Bill Mack she be glad win you see her an tole her hall dat. Joe Bedore she tole me i gom be lucky to git dat feler for tow my scow cos Joe she say she got good quant on de Lack. Nos hall dem feler wat sale scow round here es got hard tam dis sumer cos de water es hi on Lack St. Clair an she cant tuch botam wid plack pole an wen she cant tuch botam wid plack pole she hant got no quant an she got hire pilet an dat take mose hall her frate fi i git dat bote to tow my scows i hant gone need hany pilet an i kin make betur tam. hall de boy an gerl wat live on Swan Crick day say day gone git up big Skurshun on fort guly on dat big bote to go on bare crick gost i no Bill Mack she'l be glad fur dat cos i here es grate feler for fun i gone be glad wen i git quant on her. i hope you gone see her soon an wen you see her yoo tole her to rite on me an tole me wat tam she gone be here an i gone be hall redy. i gone put flash lite on de dock dis sumer so de bote kin find de dock on de nite tam dats new kine lite one i git up my self i hang lamp on post an i hire Paul Socio for terchem dolar mont, to walk back an fort in front of de lite hall nite an wen she git in front of de lite she sta dar tree seckund an den she go on an den de lite flash Mose La Croix she tole me i was fool fii dont git patin on dat lite she say fi i dont do dat day gone have hall dem kine lite on de lacks mayby i git paten out Monsieur Edditare i hope you gone do hall dem faver wat i hax on yov mayby dis feler Bill Mack dont want to com fi he dont maybe yov kin give me som point on som feler wat will be glad to com any way do de bes yov kin an i be satisfy on sam tam let me no so quick as yov cant i hope dant gone be long befor i git letter from yov. we hall sen our regard to yov an yovr famly an hope yov are hall well like us good by, from

PETER LA CHAMPAIGN,
Lock Box 3752. ALGNACK, MICHIGAN STAT.

LAKE CHAUTAUQUA.

A few years ago the passenger department of the Erie Railroad issued a profusely illustrated book descriptive of the famous Chautauqua Lake. This book became so popular and so widely circulated that the department was taxed to comply with all the demands for copies. This year the Erie has outstripped its former efforts, and has issued a larger book, with 30 fine plates, including a double-page birds-eye view of the lake and a map of the entire region. The description matter is brief but pointed, and the views which are entirely new, make it a book worthy of any library table. It will be sent on receipt of two two-cent stamps, to any address, by Mr. M. L. Fouts, Gen. Agt Pass. Dept., Garfield Building, Cleveland. There is much credit due to D. I. Roberts, of New York, general passenger agent of the line for getting up so valuable a souvenir.

A WOOD BURNING MARINE BOILER.

(BESI'S PATENT, 1893.)

Among the several types of boilers offered and built by the Marine Iron Works, of Chicago, one in particular is especially suited for small and medium size tonnage fueling with wood and carrying high steam pressure, with very ordinary attention in the way of firing.

The horizontal fire-box type (water entirely surrounding the furnace), is cylindrical in form. The flat surfaces always so objectionable in the ordinary locomotive fire-box marine boiler, are here omitted; no "water legs" to choke up with mud or sediment; no weak joints or sharp angles that impede the proper circulation of the water and which render high steam pressure dangerous.

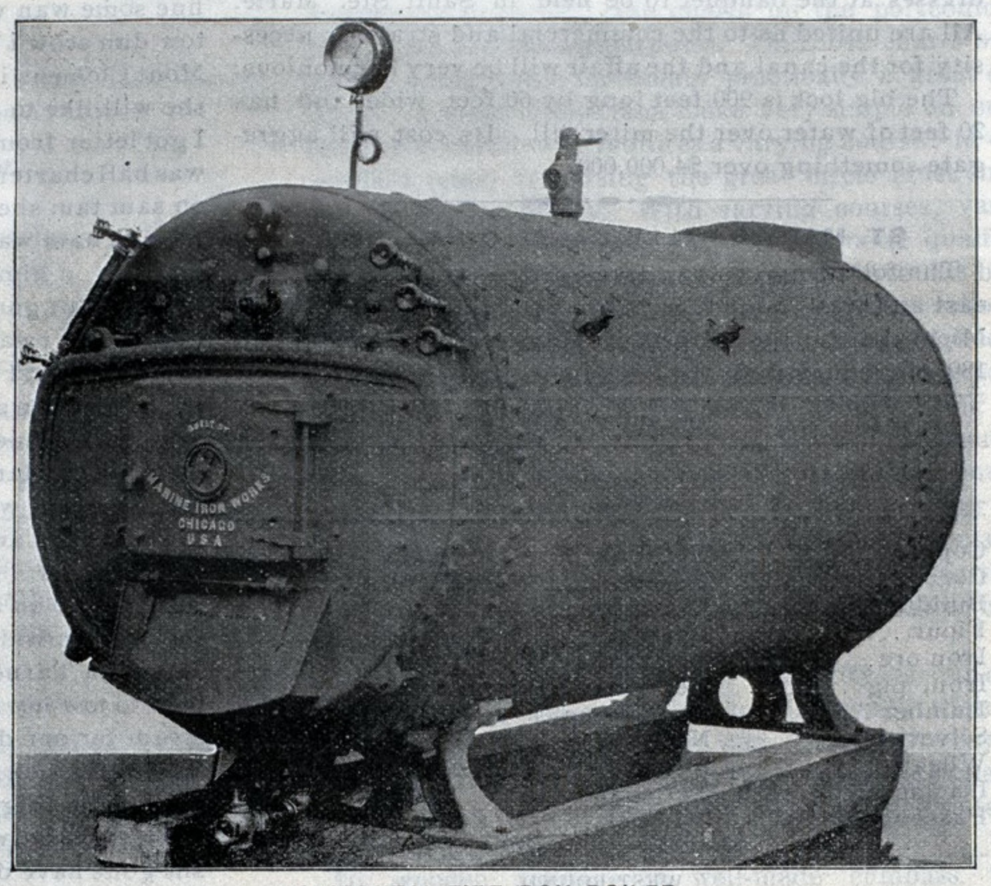
The outline illustration shown is of a boiler designed and built for use on a flat bottomed, stern wheel river boat where wood in three foot lengths is burned. The boiler is mounted on substantial iron stands, when for use in flat bottom boats, but where used in deep water boats it is advisable to use lugs, as shown in engraving No. 8.

This boiler was designed and patented by the foreman of boiler shop of the Marine Iron Works, of Chicago, an expert boiler maker of over eighteen years' experience on marine work, and this fire-box boiler has demonstrated in actual service its value for the duty described. That they are easily cleaned is apparent by an inspection of the engraving; their steaming qualities, and therefore economy, being due to the rapid circulation of the water, which can best be attained by any boiler that is internally fired, and which has no water leg. The sediment pocket at the firing end of the boiler, below the fire-box, is so arranged that it is oftener in use than is usual on boilers of ordinary type. All of the sediment being removed by simply opening the blow-off. The door on the combustion chamber is hinged so that either top or bottom section or both sections, may be removed, giving free access to the combustion chamber for cleaning purposes. Both fire front and back plates are attached to the boiler in a manner which makes them absolutely smoke tight, while the asbestos lining in the combustion chamber prevents undue radiation of the heat.

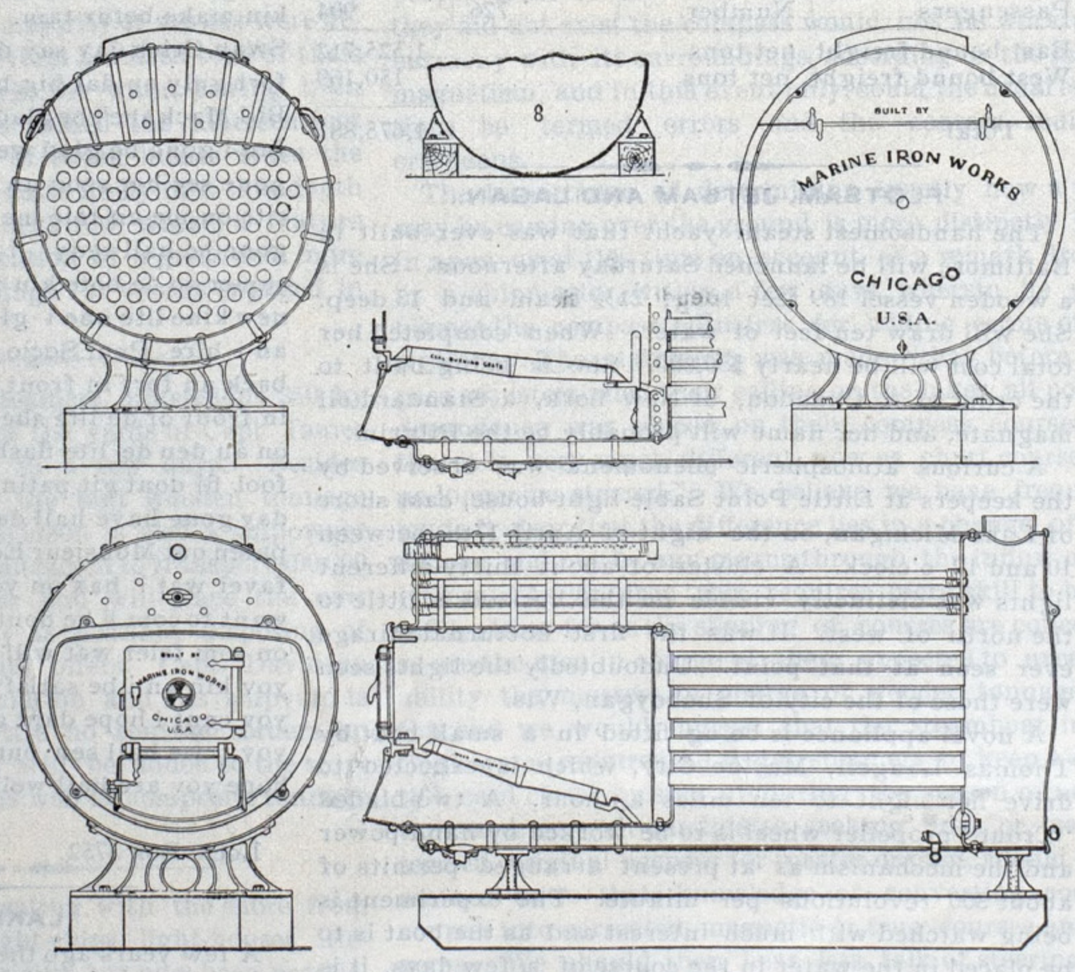
The ample storage capacity for steam in connection with the dry pipe, renders a dome unnecessary and permits keeping the weight low down in the boat.

Great care is exercised in the close and proper distribution of stay bolts and braces, and in reinforcing the holes cut and threaded for the steam fittings. As regards licensed working steam pressures and the usual dimensions of fire-boxes, for wood-burning boilers, together with size of engine cylinder suited, the manufacturers keep special and particular data.

The conservative engineer, the kind who is too intelligent to speak rashly of any piece of mechanism on first sight, and especially those who operate, superintend, and are really responsible for the successful working of the machinery, will find in these boilers much to enlist their interest.



HORIZONTAL FIRE-BOX BOILER.



WOOD-BURNING MARINE BOILER.

FOR SHORE PROTECTION.

Mattrasses have been largely used for many years in the construction of the Holland dykes and for the protection of the coast from erosion, a recent examination of some of this mattrass work by divers has shown that the old mattrasses have been torn apart in some cases by the weight of the riprap resting on them. The mattrasses were 82 by 164 ft. in size, and consisted of a bottom and a top layer of brush bundles, 3 ft. center to center and crossing each other at right angles. Around each alternate longitudinal and transverse bundle, galvanized steel wire, 5-32 in. in diameter is firmly wound spirally with about 5 in. pitch. The ends of the wire are wound three times around the ends of the bundle and fastened. The upper and lower grillages are connected by wire along the edges of the mattrass at each wire-wound bundle and in two intermediate longitudinal rows at the intersection of such bundles. A pull on the mattrass will cause the bundles to stretch, thus ordinarily diminishing their resistance. Compared with the bundles, the wire may be considered as unstretchable.

THE torpedo boat destroyer "Sturgeon," built and engined by the Naval Construction and Armaments Company of Barrow, England, while waiting for her official trial trip on the Clyde, recently made a series of progressive trials, and a speed of 28.1 knots was reached on the mile, and a speed of 27¾ knots on the three hours. The engines of the "Sturgeon" are of the three-stage compound type usual with these vessels; the chief point of interest being the boilers, which are of the new Blechynden water-tube type, and of which four are fitted. The working pressure of 200 lbs. to the square inch was maintained with the greatest ease with 2½ in. air pressure, and the working throughout was most satisfactory. This, we believe, is the first English naval vessel fitted with the new type of boiler, the latter differing from other small tube boilers in the fact that each tube can be drawn and replaced without disturbing its neighbor or taking apart flanged and bolted joints.

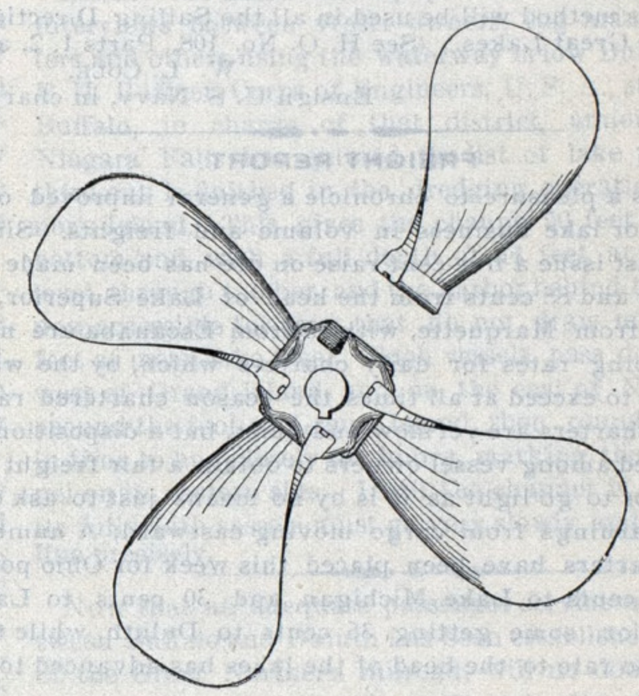
AN EFFICIENT PROPELLER.

(ILLUSTRATED)

The large tug W. G. Wilmot, built at West Bay City for service at New Orleans, La., was fitted with a sectional propeller wheel by the Dry Dock Iron Works, and that it has given excellent satisfaction is evidenced from the following letter to the makers of the wheel from the owners of the Wilmot:

"We have just finished giving the tug W. G. Wilmot her semi-annual docking and general overhauling, and now that we have been using your sectional cast steel propeller wheel since August last, we are able to give an intelligent account of our experience with it.

"We find that there has been much less wear and tear in the stern bearings of the tug, and this we attribute



very largely to the lightness of your wheel as compared with the cast iron one formerly in use. We also find that the blades of your wheel are securely in place, and have discovered nothing to indicate that they have been loose or had any play in their sockets.

"As regards the strength of cast steel as compared with cast iron, we may say that we find your wheel perfectly intact, which has not been our experience with other wheels, which usually 'chip' if they do not break, at the edges of the blades.

"So much for your wheel with respect to lightness and wearing qualities. With reference to its shape or design we may state that our captain and engineers claim a marked improvement in towing and backing qualities, and think it has been the means of saving considerable fuel, etc.; as the Wilmot has just finished her busy season, during which she towed most of the largest and heaviest steamships visiting this port, among which were the Samoa and Maroa, the largest freight steamers in the world. We consider that our test of your wheel has been both highly satisfactory and conclusive, and we have pleasure in congratulating you on the success of the experiment on our boat."

NOTES.

THE earliest list of the merchant shipping of England in existence is dated 1572, and was compiled, on the order of Queen Elizabeth, by Thomas Colshill, surveyor "of ye port of London."

THE well-known firm of Jackson & Church, machinists and engine builders, Saginaw, Mich., report business better and prospects brighter than for ten years past, and the busy scene at their works amply bears out this view. They have just shipped a double friction hoist to Ed. E. Ayers, of Chicago, of 8 tons lifting capacity; also one to the Port Huron and Washburn Line of steamers for cargo hoisting, and have recently sold over thirty of their standard deck hoists shipped to various points.

ALTERATIONS will be made in the pitch of the ram Katahdin's screw, as a result of which it is expected increased speed will be obtained. Reports have been in circulation recently that this vessel was a failure on account of her inability to make the speed required in her contract during a builder's trial. Gen. Hyde, president of the Bath Iron Works, says that it is his conviction that the vessel will fulfill all requirements of her contract. All that is wanted by the friends of the ram is that the public withhold its opinion of her until her trial by the government takes place.

WILLIAM L. BROWN, President.
WALTER F. COBB, Vice President and Treasurer.
W. I. BABCOCK, Manager.
O. R. SINCLAIR, Secretary and Asst. Treas.

Chicago Ship Building Company,

STEEL SHIPBUILDERS and DRY DOCK PROPRIETORS,

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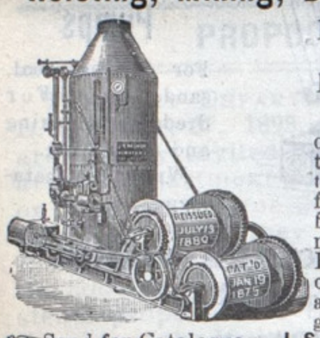

Dock Build'g, Pile Driving, Coal Hoisting and Quarry Engines

of any power, sugar cane transferring engines, transferring machines for depositing cane from car to carrier, with my improved Patent Friction Drums, with or without Boilers. Any amount of reference given. Established 1870.

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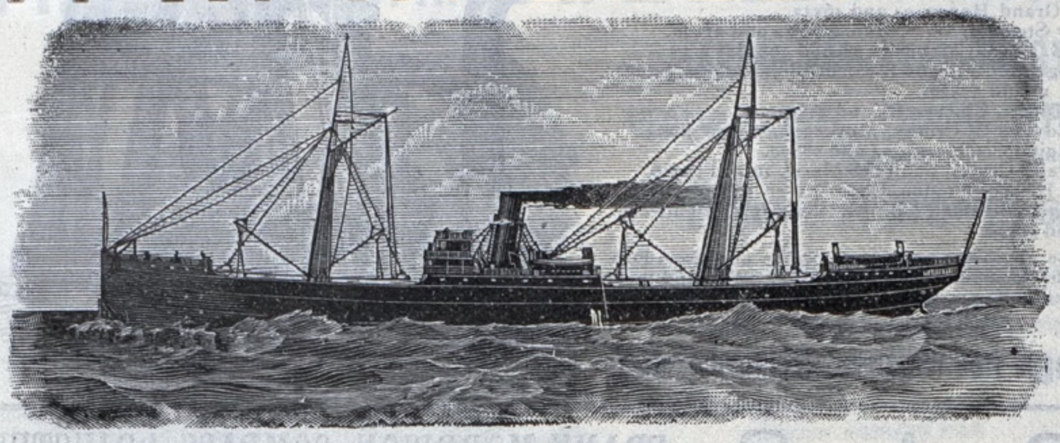

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MARINE ENGINES,

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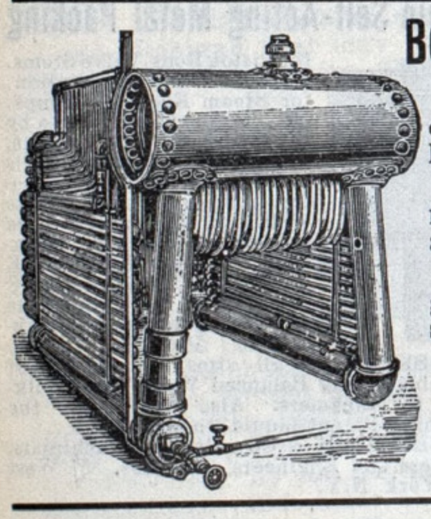

These rapid Steaming Boilers require less room, occupy less space in width, height and length; weigh less than any other.

Have short, perfect circulation, no dead ends, no joints in the fire, and any engineer can get at all parts of it.

The Steam Yacht "Rex," having 25 square feet grate surface and 1000 square feet heating surface, steamed 144 miles on 1000 lbs. of coal.

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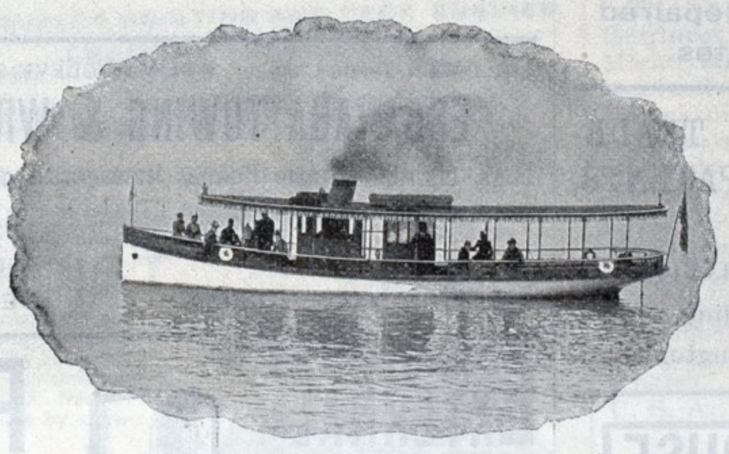

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Marine Valve, Renown Engine, Eldorado Engine, Crank Case, Victor Signal, Dark Lubricating, Mineral Seal, Head Light, Arctic Cup Greases, and Lard Oils,

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Per Day. $1.50. H. H. JAMES.

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Low Excursion Rates West June 11th, via the Nickel Plate Road. Superb sleeping cars and sumptuous diners make travel on this popular line a luxury. 247

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MANUFACTURERS OF

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Marine and Stationary Engines

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Heavy Castings a Specialty. Prices Quoted on Application.

Fore and Aft Compound Marine Engines.

The Engines in the ollowing boats are of our manufacture.

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Passenger and Freight Steamer, Mabel Bradshaw, Muskegon, 16 and 28x26.
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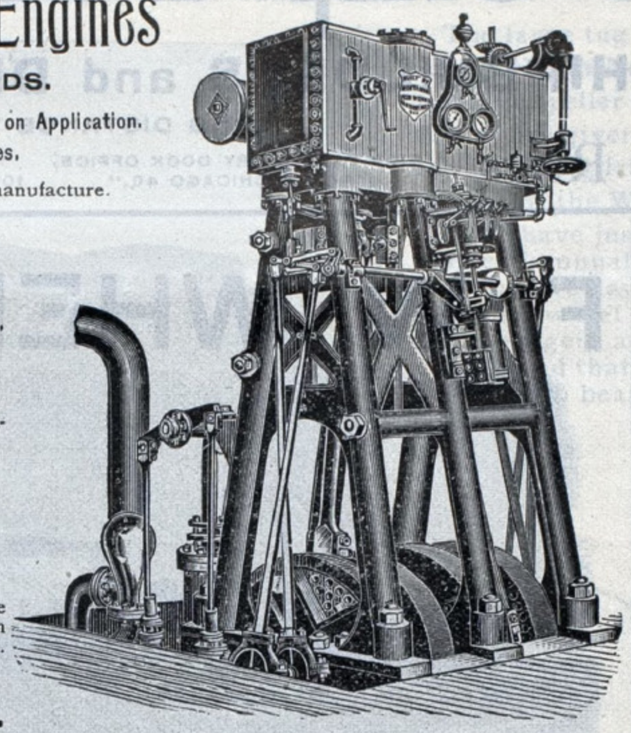

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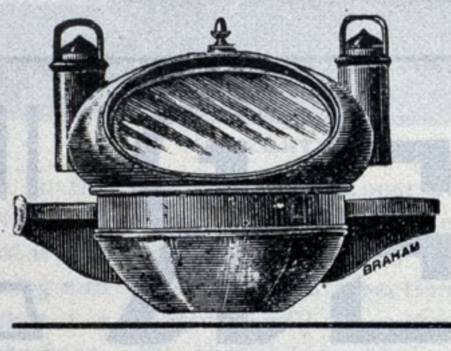

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TUG SWAIN STATIONED AT MACKINAW CITY.
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Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.

TUG MONARCH—Engine Compound, Cylinder 16 & 30 in. diameter, 30 in. Stroke, Steam Pressure allowed, 125 lbs.

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CENTRIFUGAL PUMPS. **SEVEN AND FOURTEEN INCH SUCTION.**

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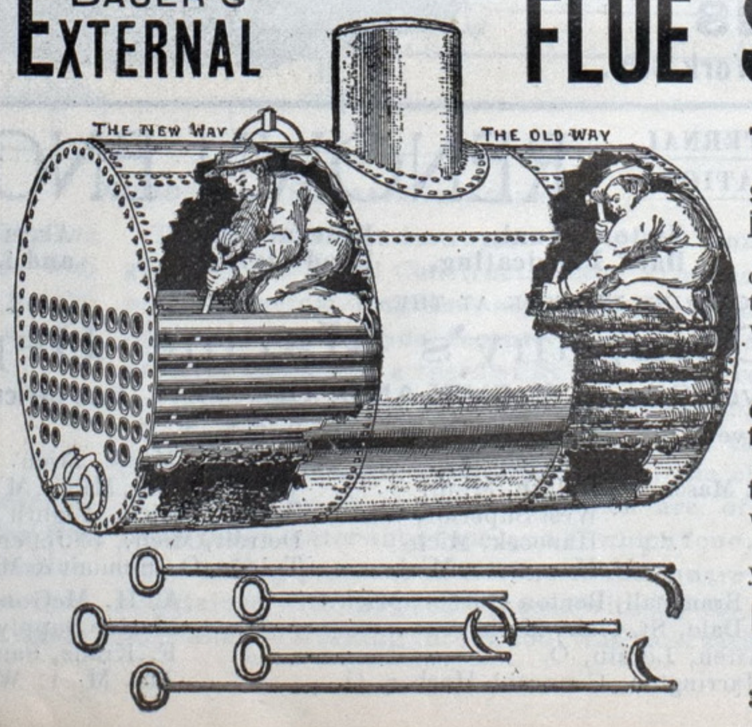

THE only device that will effectually **remove Scale** and **Sediment** from Flues **without injury** to flues or boiler.

Made of tool steel, hardened, concaved and ground, producing two sharp edges, and can be worked either way.

A Set will last about 10 years. Used in **more than 90 different cities** and give **universal satisfaction.**

A **Shell Scraper** and a **patented inside flue cleaner** given with each set.

Send **outside diameter** of your flues for a trial set.

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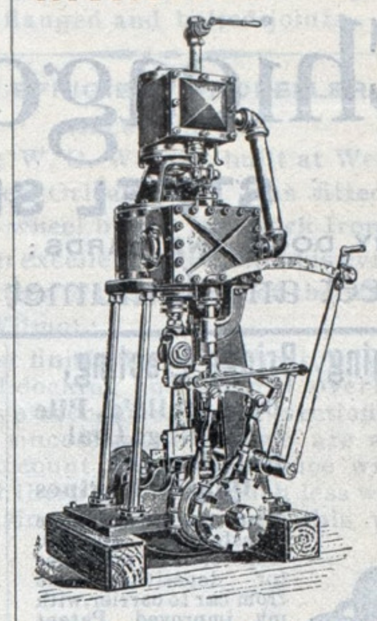

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5 TO 200 HORSE-POWER. These engines are high-class in workmanship and material and moderate in price.

Send for cuts, description and prices

Centrifugal Pumps

For raising coal, sand, &c. For dredging, wrecking and circulating.

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Mfrs. Yacht, Boat and Canoe Hardware.
Special Work a Specialty.
Boat Rails, Stanchions, Etc.

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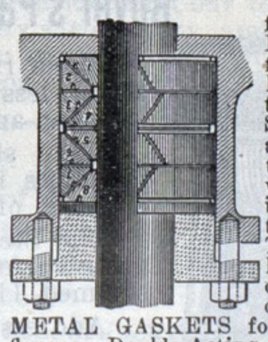
Commencing Sunday May 19th, the day coaches on all through trains of the Nickel Plate Road will be attended by a colored porter whose services are placed at the disposal of the patrons of the line. The purpose of this equipment is to insure scrupulously clean cars enroute. 254–26

Katzenstein Self-Acting Metal Packing



for Piston Rods, Valve Stems, Etc., of every description, for Steam Engines, Pumps, Etc. Adopted and in use by the principal Iron Works, Steamship Companies, Mills and Engine Builders, Electric Light and Power Plants within the last twelve years in this and foreign Countries. Also FLEXIBLE TUBULAR METALLIC PACKING for Slip-Joints on Steam Pipes and for Hydraulic Pressure. Also METAL GASKETS for all sizes and shapes of flanges. Double-Acting Balanced Water-tight Bulkhead Doors for Steamers. Also Agents for the McColl-Cumming Patent Liquid Rudder Brake.

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Automatic Piston or Mocking Bird Whistles. Special Whistles made to order. Penna. Steam Flue Cleaner. Water Gages, Penna. Gage Cocks, Air Cocks, Oil Cups, Brass and Bronze Castings a Specialty.

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West, Northwest and Southwest. Agents of the Nickel Plate Road are authorized to sell Homeseekers' Excursion tickets May 21st and June 11th. An unexcelled dining car service and palatial sleepers on through trains between Chicago, Buffalo, New York and Boston. 246–23

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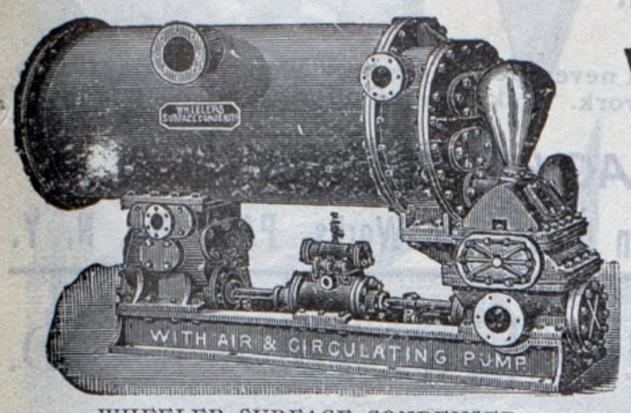
WHEELER'S IMPROVED SURFACE CONDENSERS

Mounted upon Combined Air and Circulating Pumps.



WHEELER SURFACE CONDENSER,
Mounted on Combined Air and Circulating Pumps.

Sole Proprietors and Manufacturers of the
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WHEELER FEED-WATER HEATER, AIR AND CIRCULATING PUMPS.
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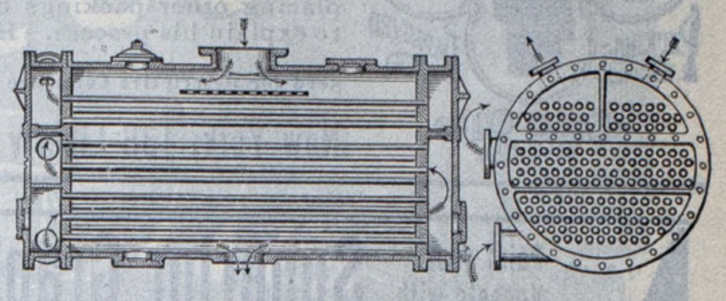

PATENT COMBINED SURFACE CONDENSER AND FEED-WATER HEATER.

PROPOSALS.

TREASURY DEPARTMENT, Washington, D. C., May, 27, 1895. Sealed proposals are hereby invited and will be received at this Department until 2 o'clock P. M., on Thursday, June 20th, 1895, at which time and place they will be opened in the presence of attending bidders, for the construction by contract of one steel steam propeller for the Revenue Cutter Service of the United States, for service on the Great Lakes, to be known while in course of construction or until launched, as "No. 1, R. C. S." The limit of the appropriation for the construction and completion of this vessel is $175,000, Said vessel is to be constructed in accordance with plans and specifications provided by the Secretary of the Treasury. Plans and specifications for the construction of said vessel may be seen and examined at this Department at any time after the 1st day of June 1895, and blue prints will be furnished to bidders upon application to this Department at any time after that date, and printed specifications a few days later. Instructions to bidders and contractors, forms of proposals and contract, bond and bondsmen's oath, may be obtained at any time after June 1st, 1895, on application to the Division of Revenue Cutter Service, Treasury Department, where all information essential to bidders can also be obtained. Proposals for construction of said vessel will be considered only from such ship-builders as can show to the satisfaction of the Secretary of the Tressury that they are possessed of the necessary plant and facilities for the performance of the work. Evidence as to this ability must be submitted to the Department at time of filing the proposal or not later than 2 P. M., June 20th, 1895. Each proposal must include the construction of both the vessel and her machinery, complete in all respects as required by the plans and specifications. The said vessel must be completed and delivered at some Port on Lake Michigan that may be designated by the Secretary of the Treasury on or before July 1, 1896, and bidders are informed that because of the urgent need of speedy delivery of said ship, the element of time to be consumed in the construction of said vessel will be given due consideration in determining the award of the contract. Each proposal must be accompanied with a cash deposit or certified check payable to the order of the Secretary of the Treasury in the sum of $5,000.00, which shall become the property of the United States, in case the successful bidder shall fail to enter into the requisite contract and furnish the requisite security on the acceptance of his proposal. Bids must be addressed to the Secretary of the Treasury, and be endorsed on the envelope "Proposal for building a steam revenue vessel for the Great Lakes." The right is reserved to reject any or all bids, and to waive defects if deemed for the interests of the Government so to do. S. WIKE, Acting Secretary.

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STEAM FITTING and HEATING,
Wrought Iron Pipe & Fittings, Engineer's Supplies
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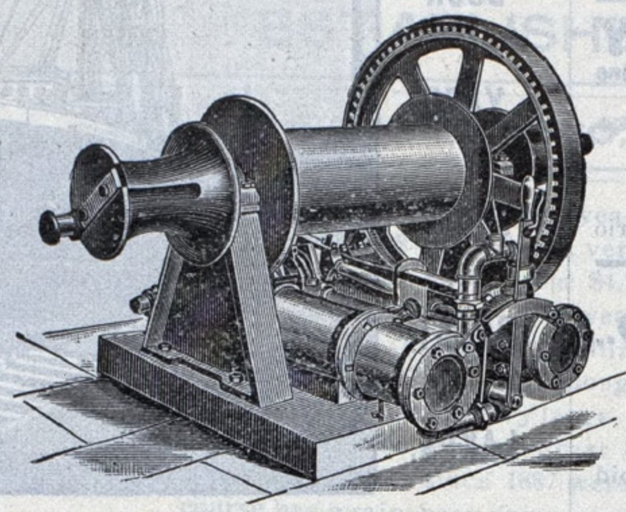

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ENGINES.

Starting, Stopping, Reversing and Lowering all done by working one Lever.

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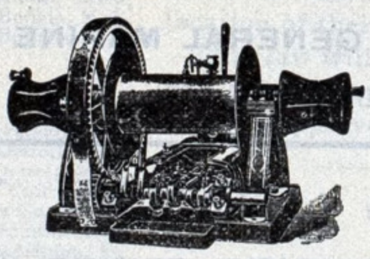

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BUILDER OF DUPLEX HOISTING AND DECK ENGINES.

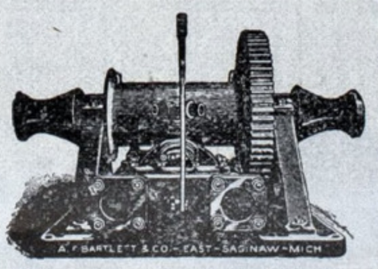
Plain Finished and Automatic **ENGINES,** From Heavy Patterns at Moderate Prices.

Vertical, Horizontal, Marine and Locomotive **BOILERS** Strictly First-Class and Highest Test.

SEND FOR CIRCULAR AND PRICES. SAGINAW, MICH.

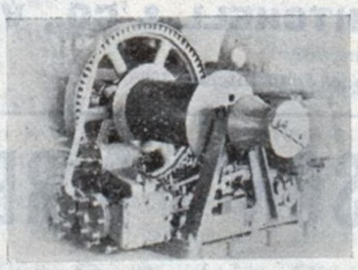
BARTLETT DECK HOIST.

In use on the ollowing vessels: Steamers—Roumania, Bulgaria, Germanic, Brittanic, George G. Hadley, S. S. Wilhelm, Majestic, Alex. Nimick, John Harper, Walter Vail, Panther, City of Berlin, City of Paris, City of Glasgow, City of London. Schooners—Tokio, Asiatic, Baltic, Celtic, Aberdeen, William D. Becker. Stopping, Starting, Reversing and Lowering, all done by working one lever.



A. F. BARTLETT & CO., - East Saginaw, Mich.

DECK AND DOCK HOISTS



Our Hoists will be found on the following boats: Tugs—Sumner, Sweepstakes, Winslow, J. K. Emmett, Acme, Mockingbird, Waldo Avery, Reliance, John Owen, Charlton, Howard, Duncan City, Chamberlain, Balize, Sampson, Westover, Gladiator, W. B. Castile, Home Rule, Robert Weideman, Boscobel and Peter Smith; Propellers—J. J. McWilliams, I. W. Stephenson, John W. Pauly; Barges—Jenness, Noquebay, Manta ee. Also in use by F. W. Wheeler & Co., W. B. City, Mich., Blood and Hart, Marine City, Mich., Michigan Salt Works, Marine City, Doty Bros., Pile Drivers, Toronto, Canada.

MARINE IRON CO., - - Bay City, Mich.

PROPOSALS.

U. S. ENGINEER OFFICE, 34 West Congress St., Detroit, Mich., May 8, 1895. Sealed proposals for furnishing all labor, materials and appliances, and removing material from Movable Dam and from 800-ft. Lock Approaches, also for constructing piers for Lock Approaches, will be received here until 2 p. m., June 7, 1895, and then pubiicly opened. All information furnished on application. O. M. POE, Col., Engineers. 19-22

TO IRON MANUFACTURERS. Office of U. S. Light-House Engineer, Ninth District, Detroit, Mich., May 21, 1895. Sealed proposals will be received at this office until 3 p. m. of Monday, the 10th day of June, 1895, for furnishing the material and labor of all kinds necessary for the construction, erection and delivery of the iron tower at Calumet Pierhead, Ill. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. 22

TO BUILDERS. Office of Light-House Engineer, Tenth District, Cleveland, O., May 27, 1895. Proposals will be received at this office until 12 o'clock noon, of Thursday, the 13th day of June, 1895, for furnishing the materials and labor of all kinds necessary for the construction of crib and stone foundations for front and rear beacons of Sandusky Bay Range Light Station, Ohio. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. JARED A. SMITH, Lieut. Col. Corps of Engineers, U. S. A., Engineer 10th Light-House District. 22-23

TO BUILDERS. Office of Light-House Engineer, Eleventh District, Detroit, Mich., May 31, 1895. Proposals will be received at this office until 3 P. M., of Wednesday, the 26th day of June, 1895, for furnishing the materials and labor of all kinds necessary for the construction, erection and delivery of the Round Island Light Station, Straits of Mackinac, Michigan. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. 23-24

TO IRON MANUFACTURERS. Office of U. S. Light-House Engineer, Eleventh District, Detroit, Mich., May 31, 1895. Sealed proposals will be received at this office until 3 o'clock P. M. of Wednesday, the 26th day of June, 1895, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal work for the Round Island Light Station, Straits of Mackinac, Michigan. Plans, specifications, forms of proposal and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. 23-24

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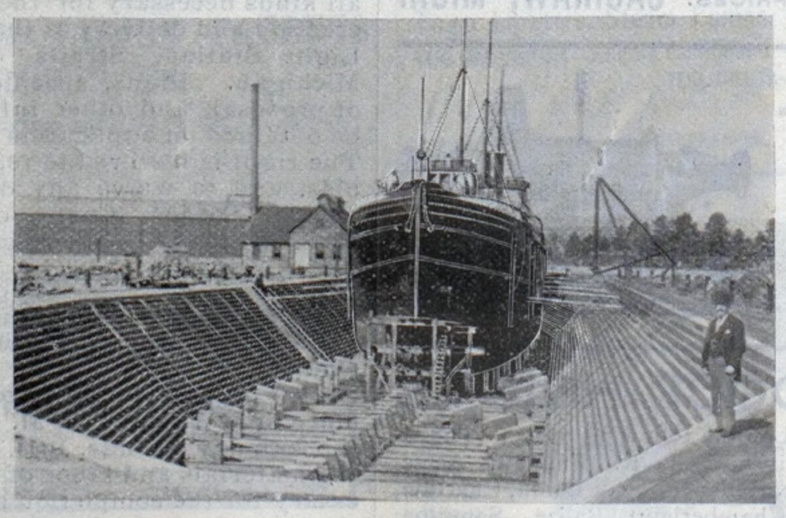

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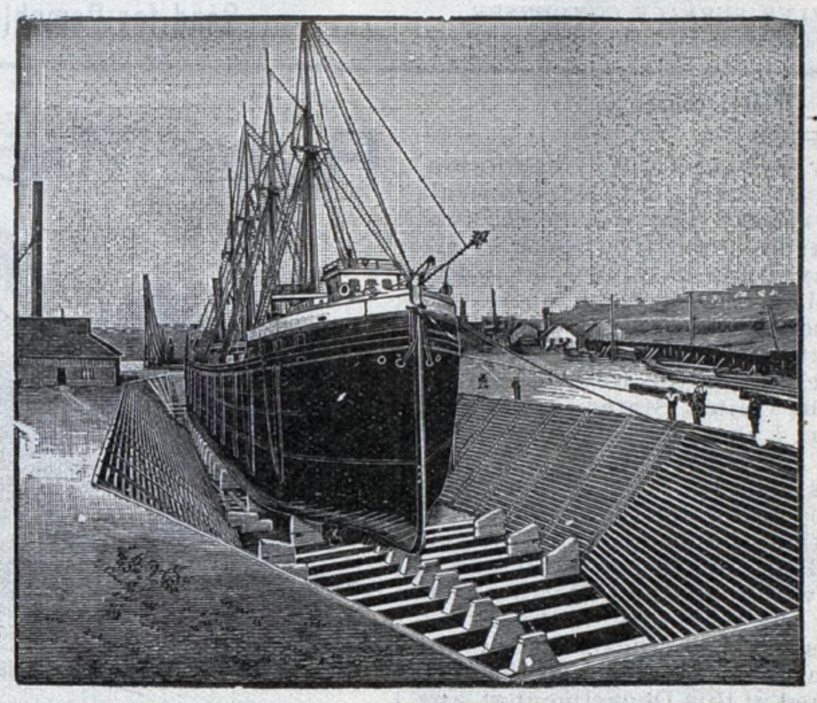

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